FOOD MANUFACTURE

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University of Massachusetts
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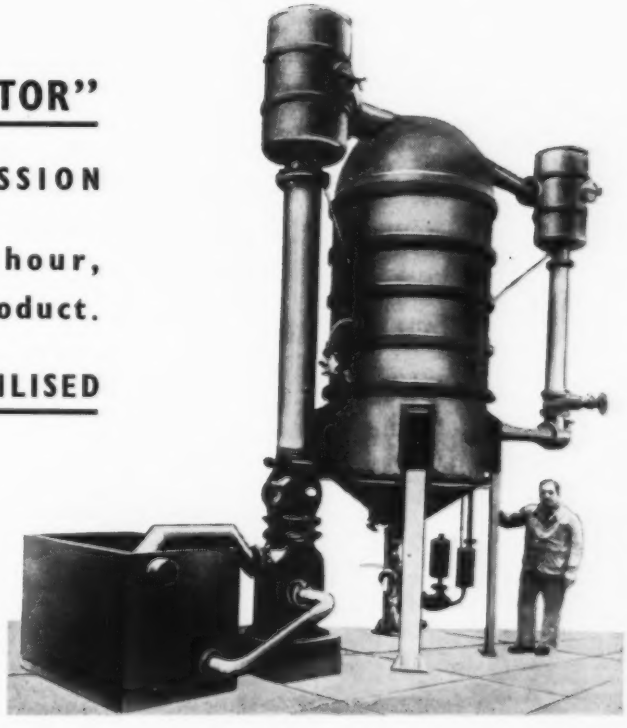

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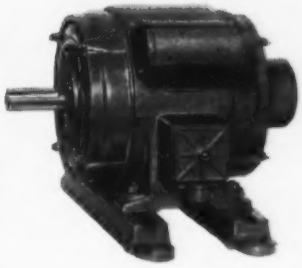

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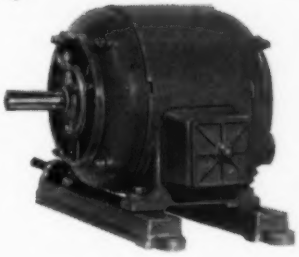

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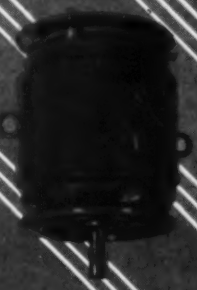

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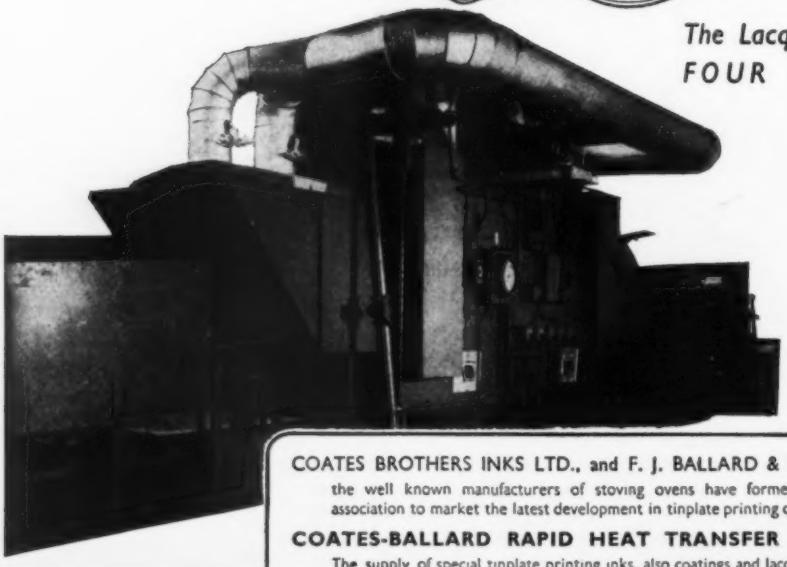

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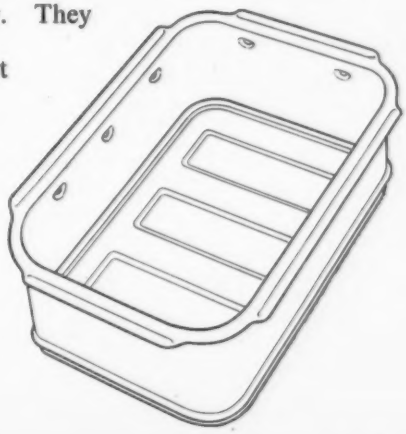

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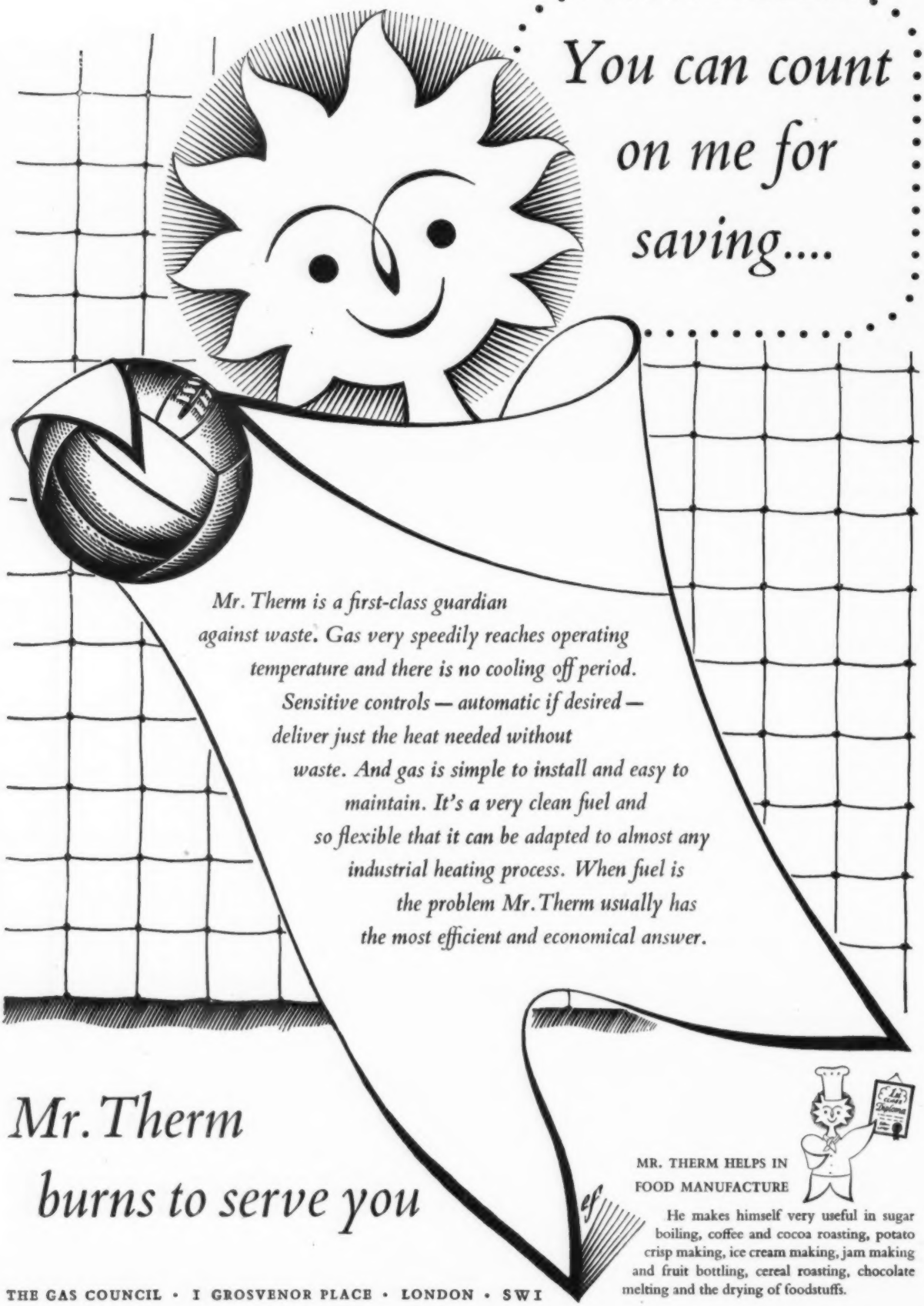

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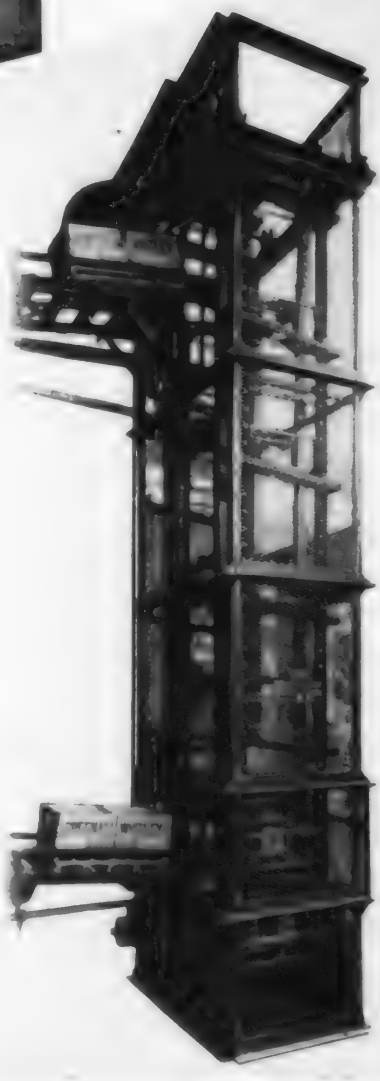

Aircush Lowerator *(above)*

Occupies as little as 8 sq. ft. of floor space and lowers up to 600 bottle cases per hour from floor to floor **using only Gravity.** Completely shockless in operation with automatic feed and discharge.

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Requires little floor space and elevates approx. 720 bottle cases an hour with automatic feed and discharge. Has a low feed height and serves any number of floors with intermediate discharge. Discharges on same side as feed or on the opposite side.

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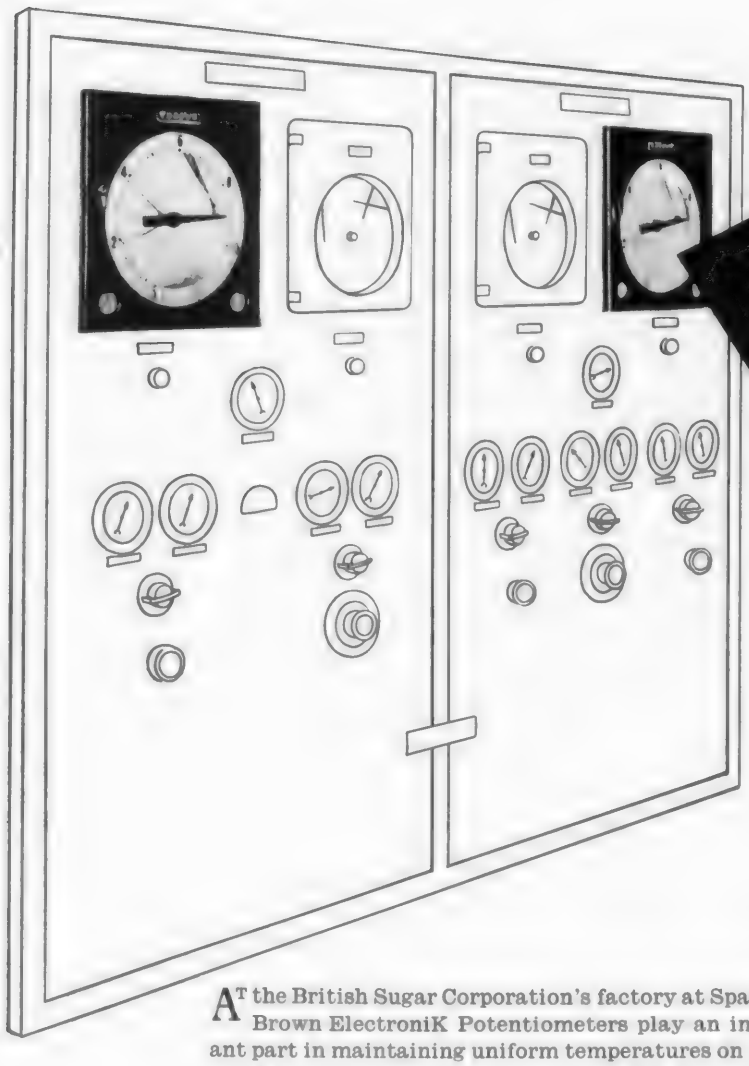

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Hagan Pulp Drier Control System designed and installed by James Gordon & Co. Ltd.

Illustration by courtesy of the British Sugar Corporation Ltd.

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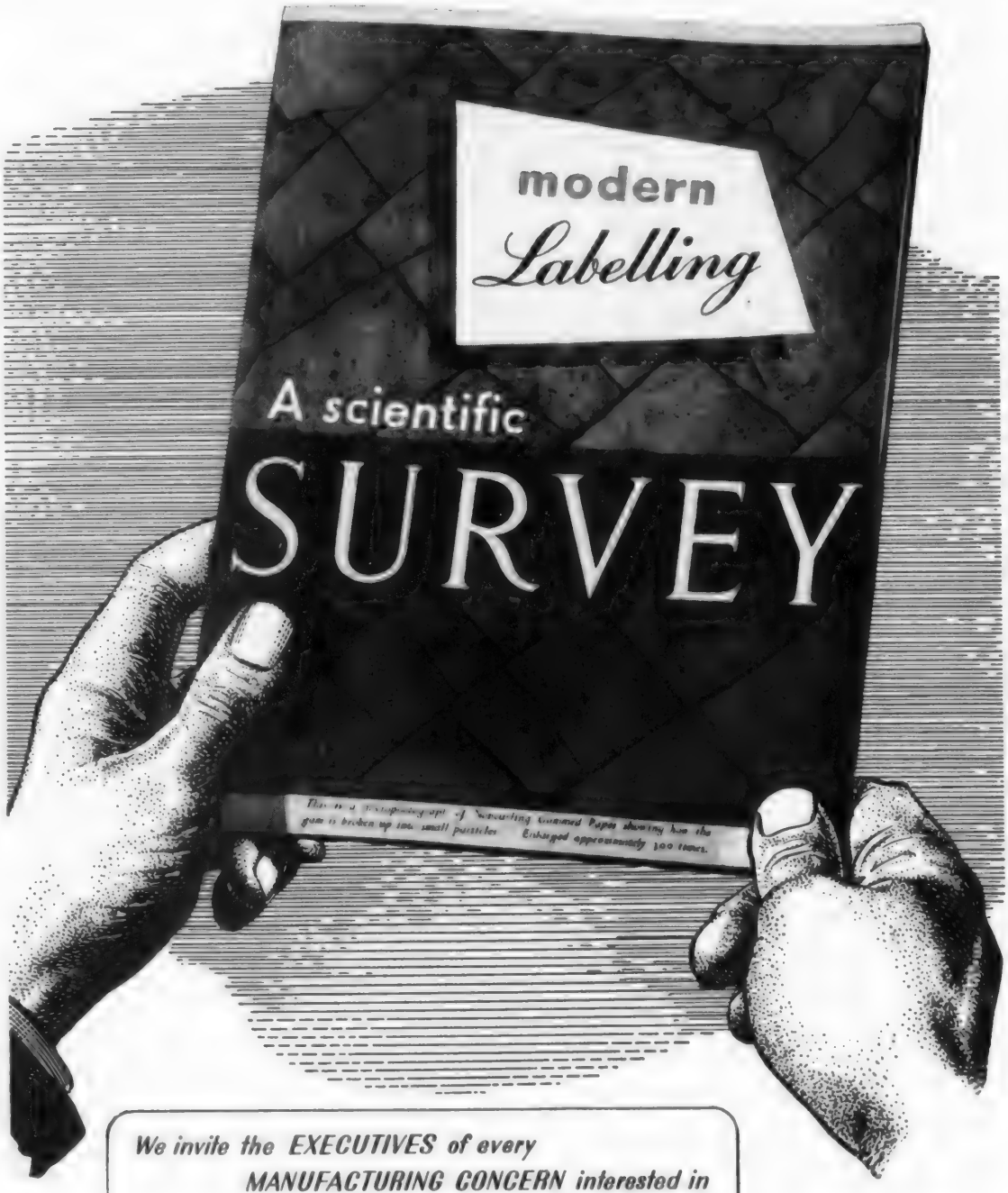

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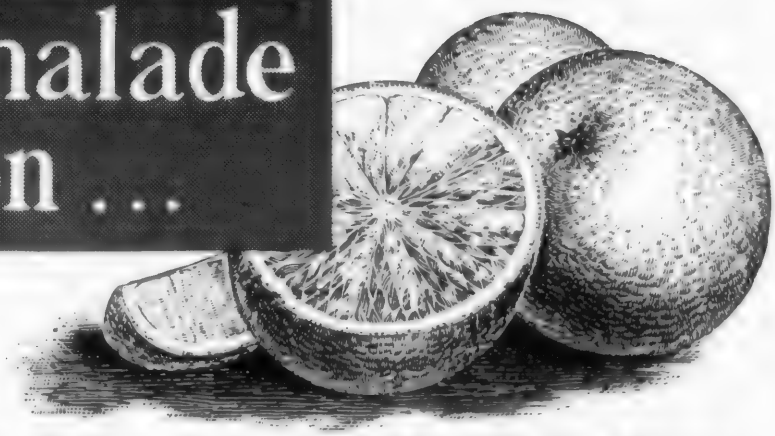

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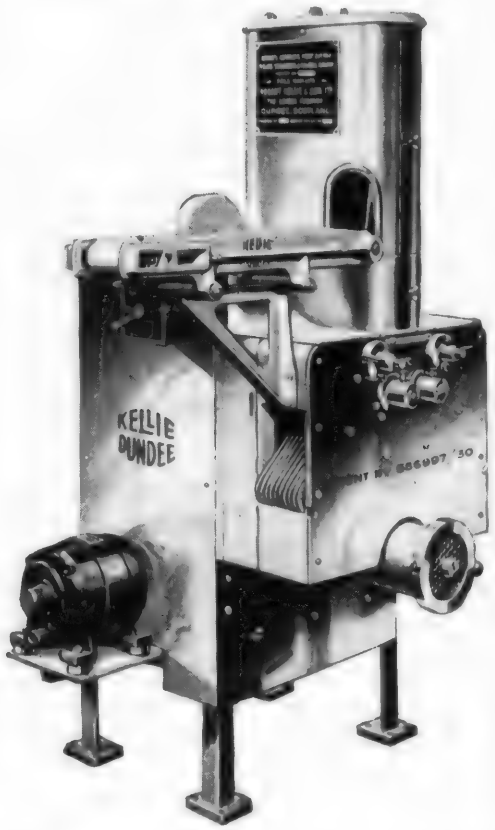
Arranged for direct coupled electric motor or belt drive with fast and loose pulleys.



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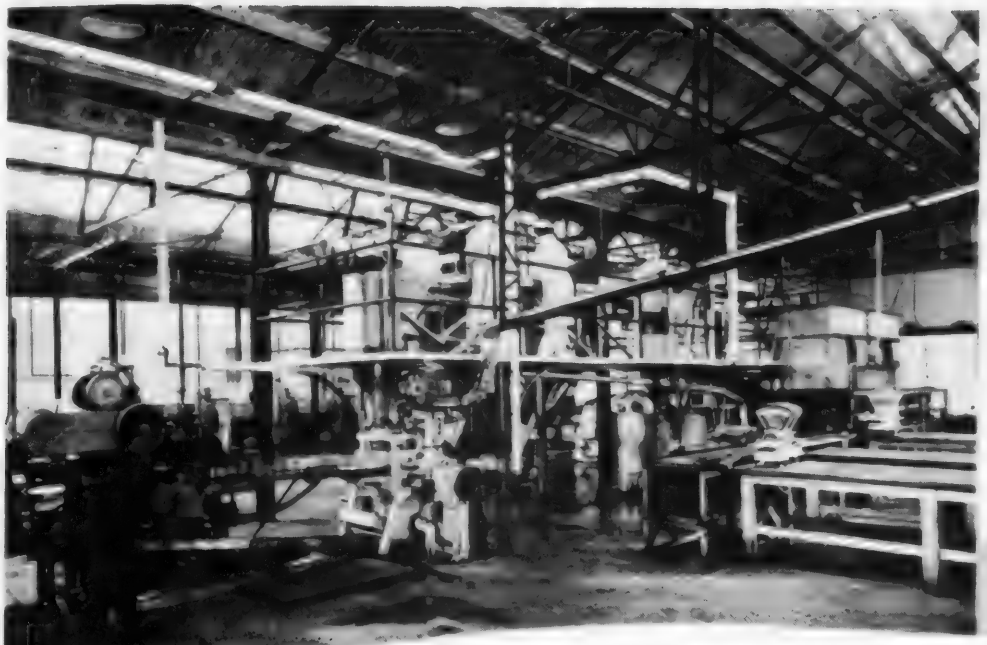

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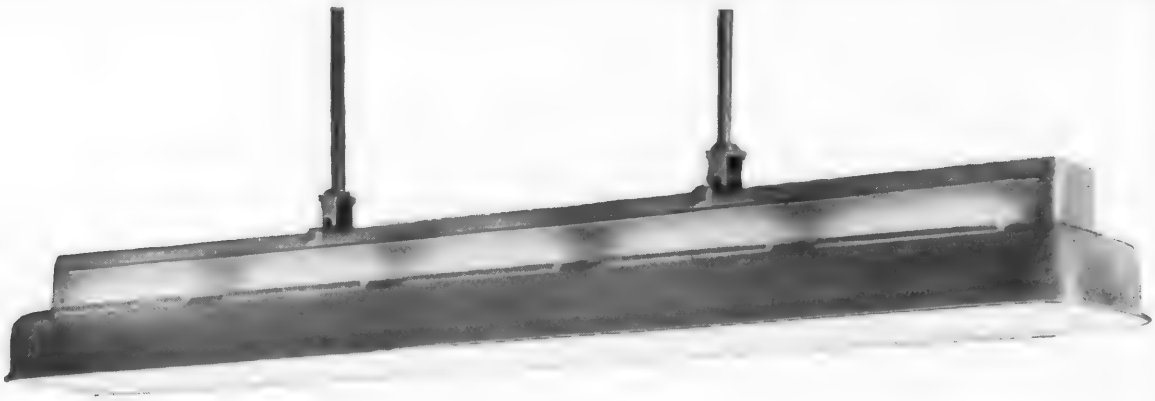

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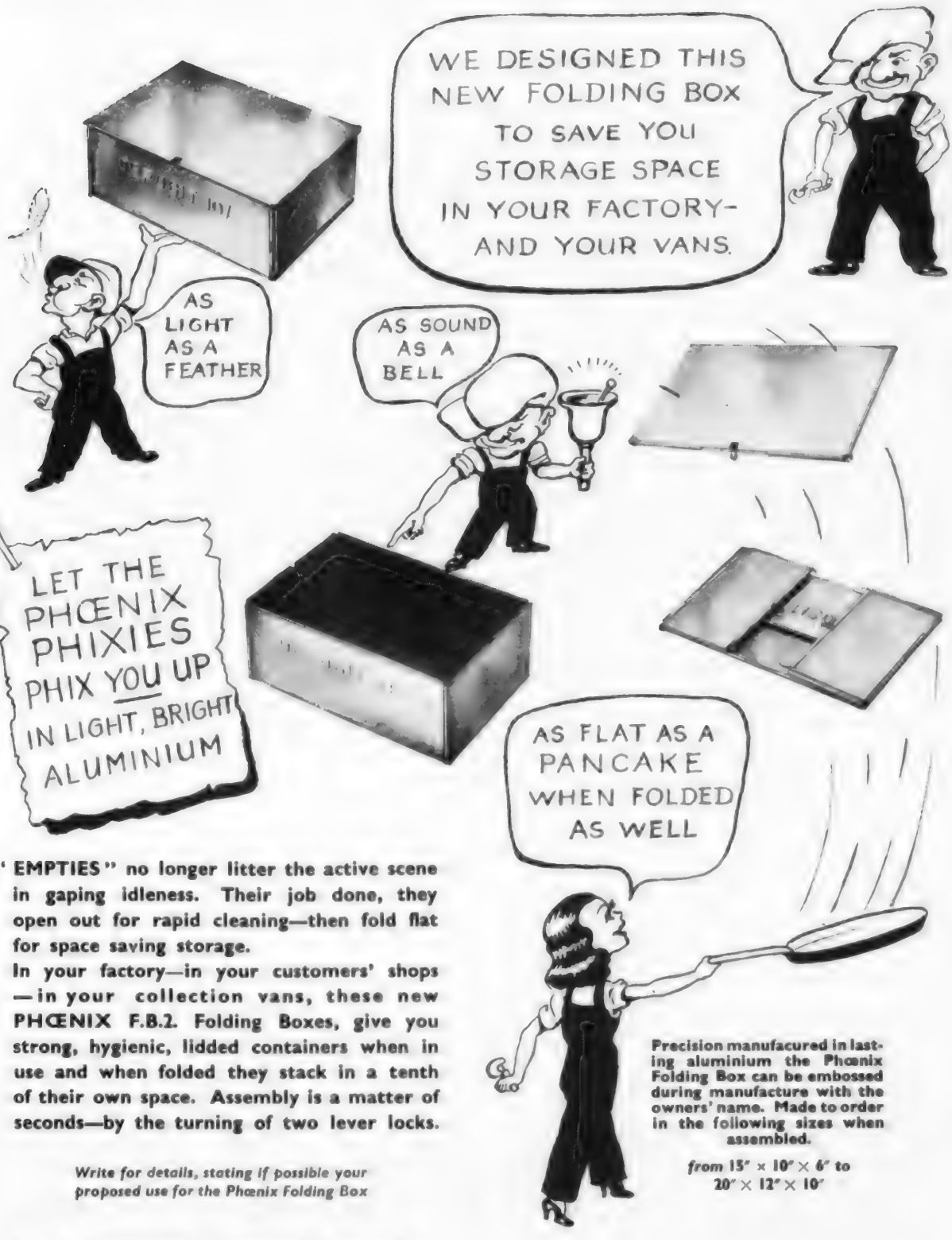
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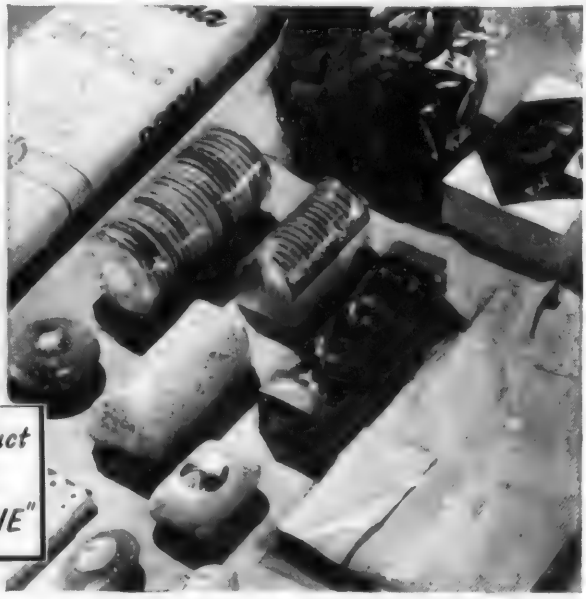

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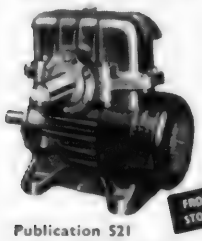

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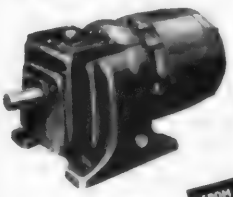

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DOUBLE HELICAL GEAR UNITS

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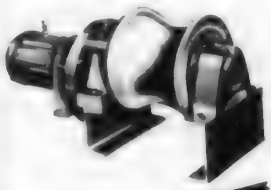
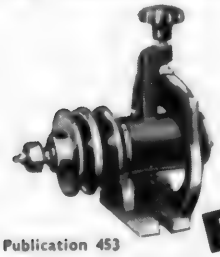
MOTOR DRIVEN ROLLERS



Publication M.R1 — QUICK DELIVERY

C-JR VARY-SPEED CONTROLS



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V-ROPE VARIABLE SPEED PULLEY DRIVES

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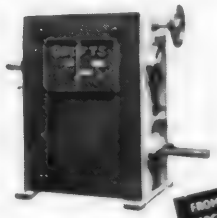
VARIABLE SPEED GEARS



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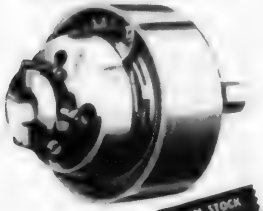

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FLEXIBLE COUPLINGS (ALL TYPES)

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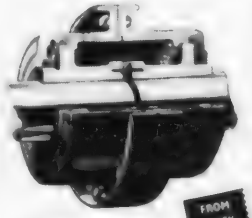
INTERNAL GEAR COUPLINGS



Publication 4716 — FROM STOCK

RIGID COUPLINGS (ALL TYPES)

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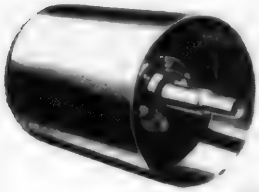

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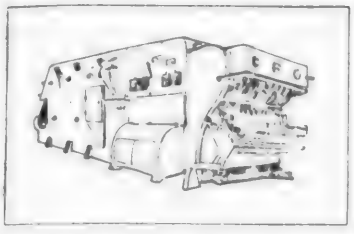

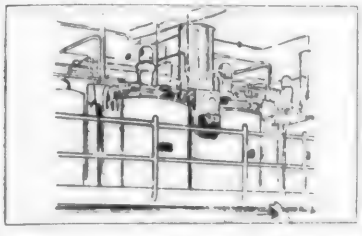

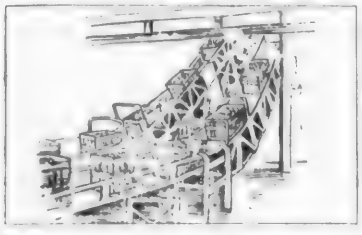

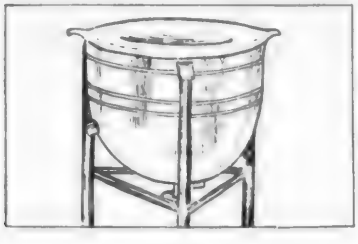

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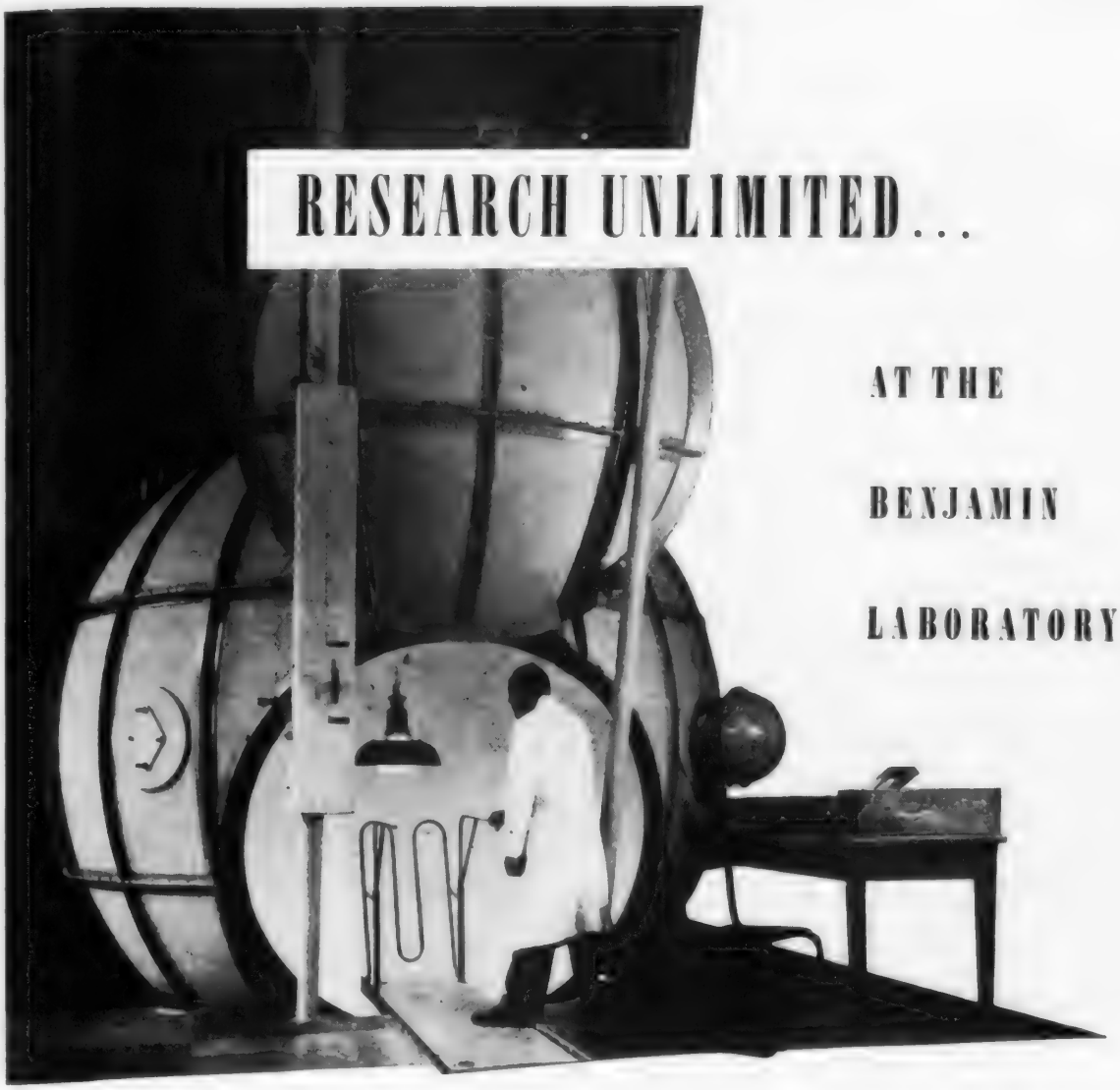

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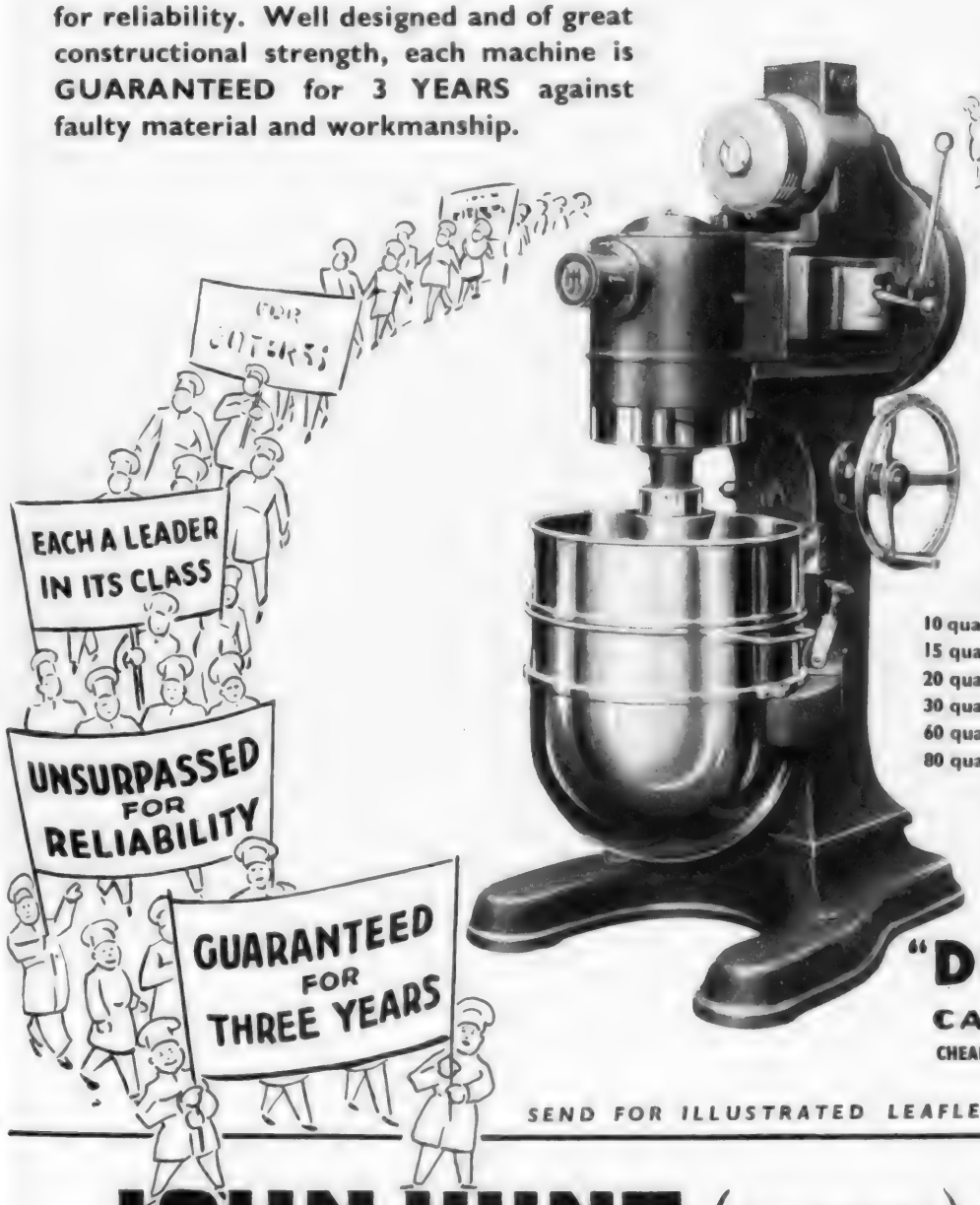

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Plant and Layout

TECHNICAL PUBLICATION No. 2 OF THE RURAL ENGINEERING SERVICE OF THE FRENCH MINISTRY OF AGRICULTURE

English translation and diagrams prepared by

V. L. S. CHARLEY, B.Sc., Ph.D.
PAMELA M. MUMFORD
and E. J. MARTIN

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THIS book is a translation of a publication issued by the French Ministry of Agriculture in association with technical services of the French cider industry. Although the text deals primarily with the layout and equipment of a cider factory there is a brief description of the principles involved in each process. Fifty-four detailed drawings are given, showing accepted layouts for buildings and plant in the cider factory. Perhaps one of the most interesting features in the book for English cider makers will be the wealth of information on refrigeration and cold storage of cider. There is an abundance of drawings clearly illustrating the latest types of cool storage installations in France, and such drawings are now being made available in the English language for the first time.

CONTENTS : General information on Cider Making. Construction and Management of the Cider Factory. The Factory Entrance. Reception and Storage of Fruit. Handling of fruit. Milling of Fruit. Keeving and Racking. Construction and Equipment of the Keeving Building. Special Machine Room. Refrigeration Equipment. Steam Production. Pipelines. The Distillery. The Laboratory. Water Supply. Ventilation. Drainage. Electrical Installations. Subsidiary Buildings. Specification of Plant. Appendices.

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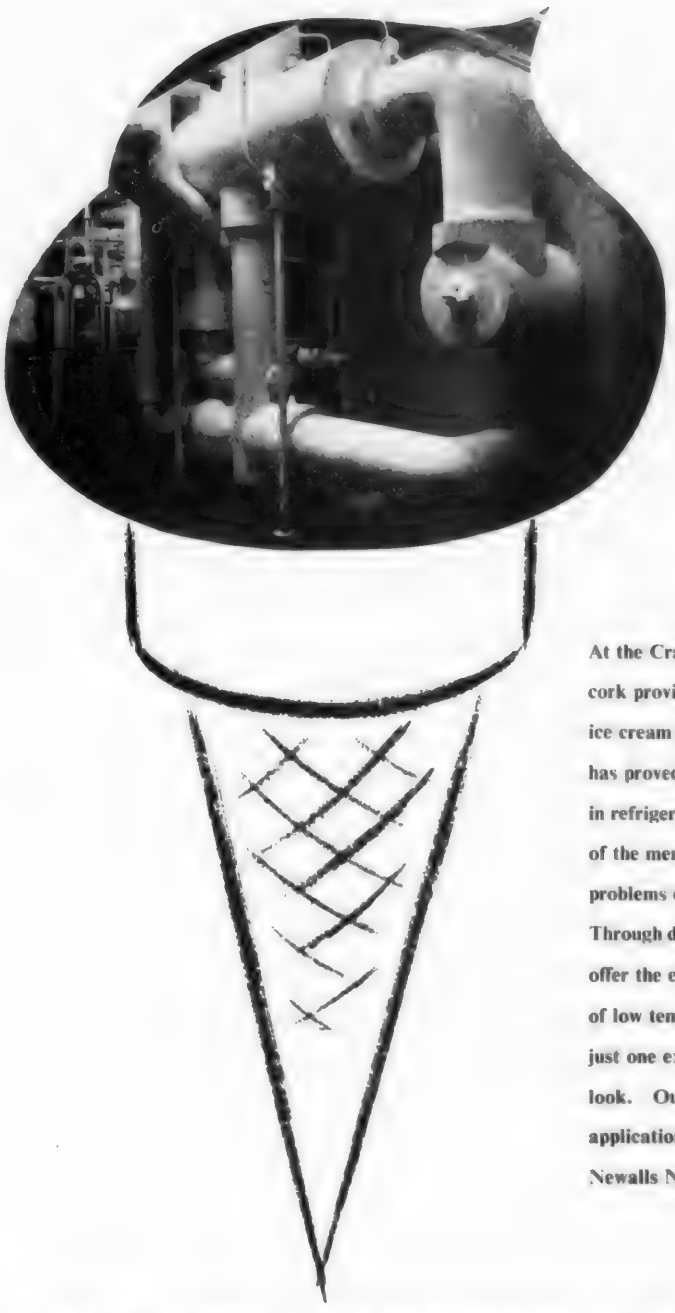

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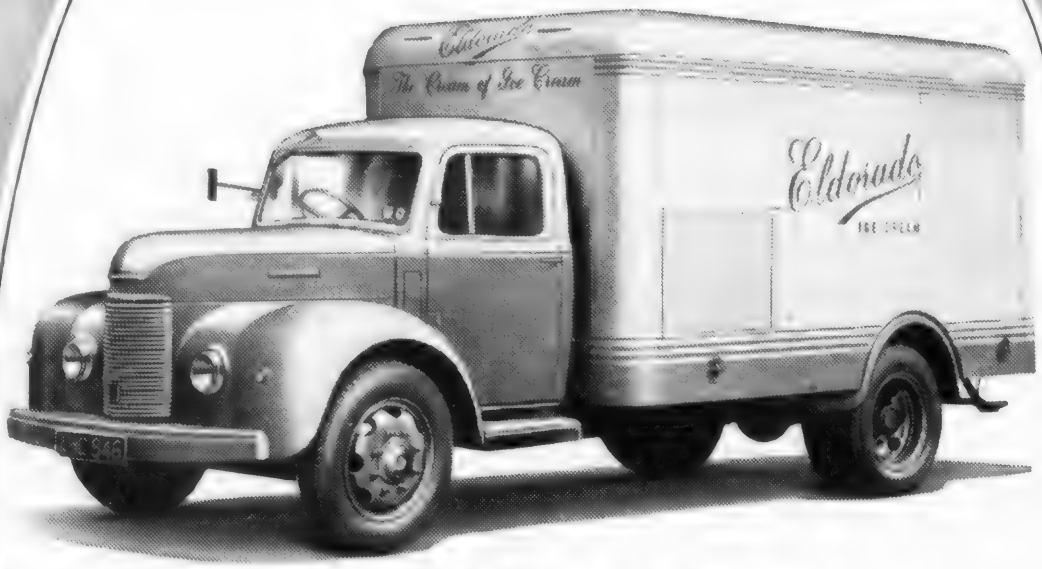

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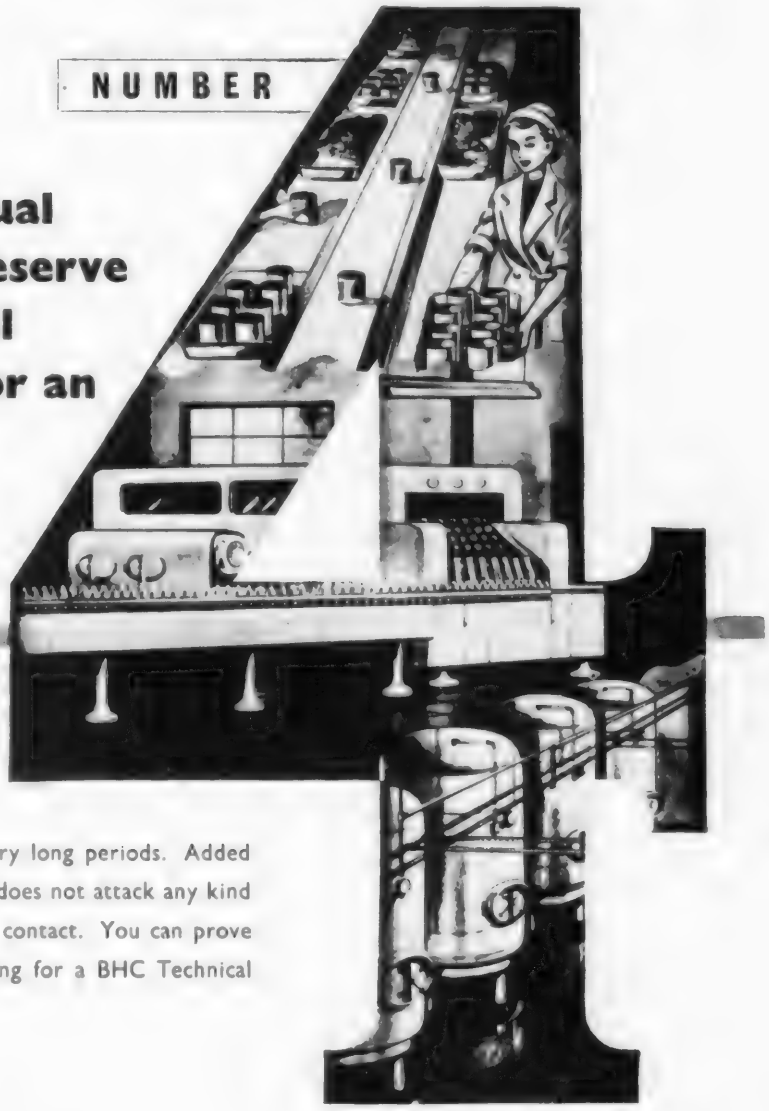

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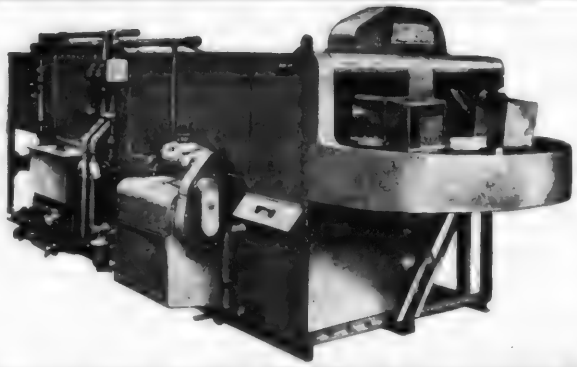

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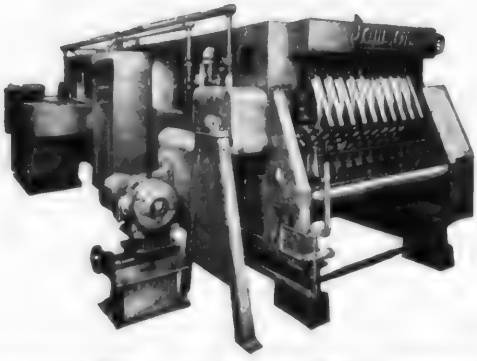

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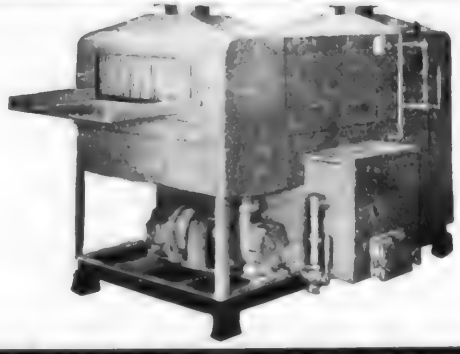

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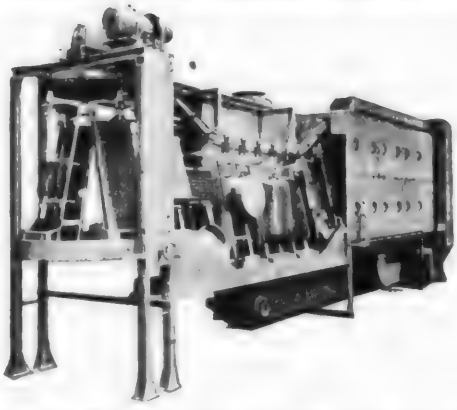

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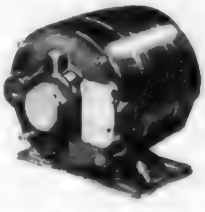

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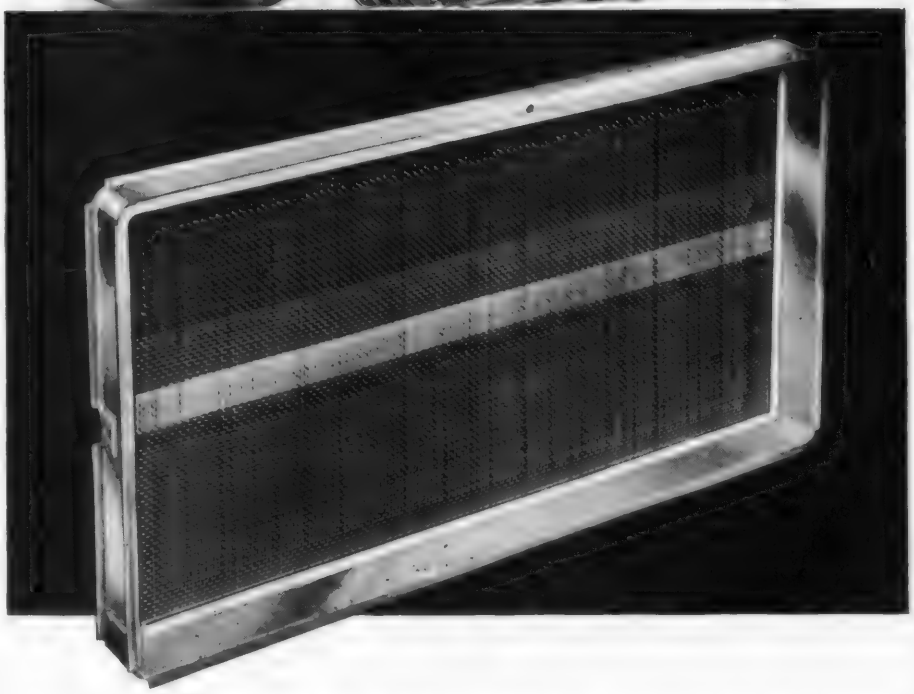

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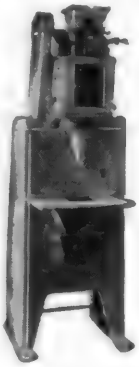

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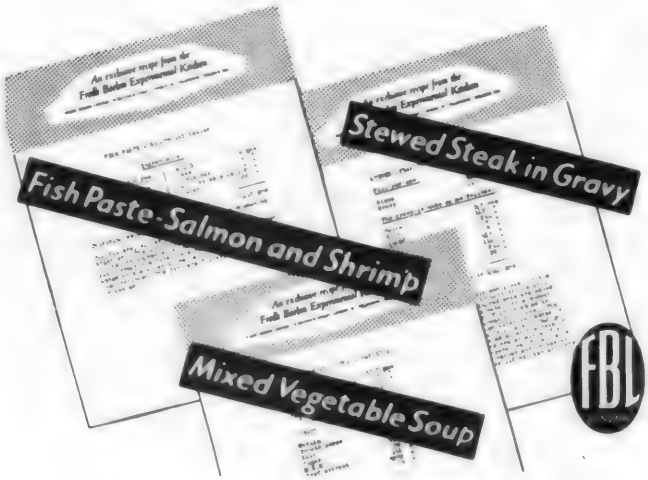

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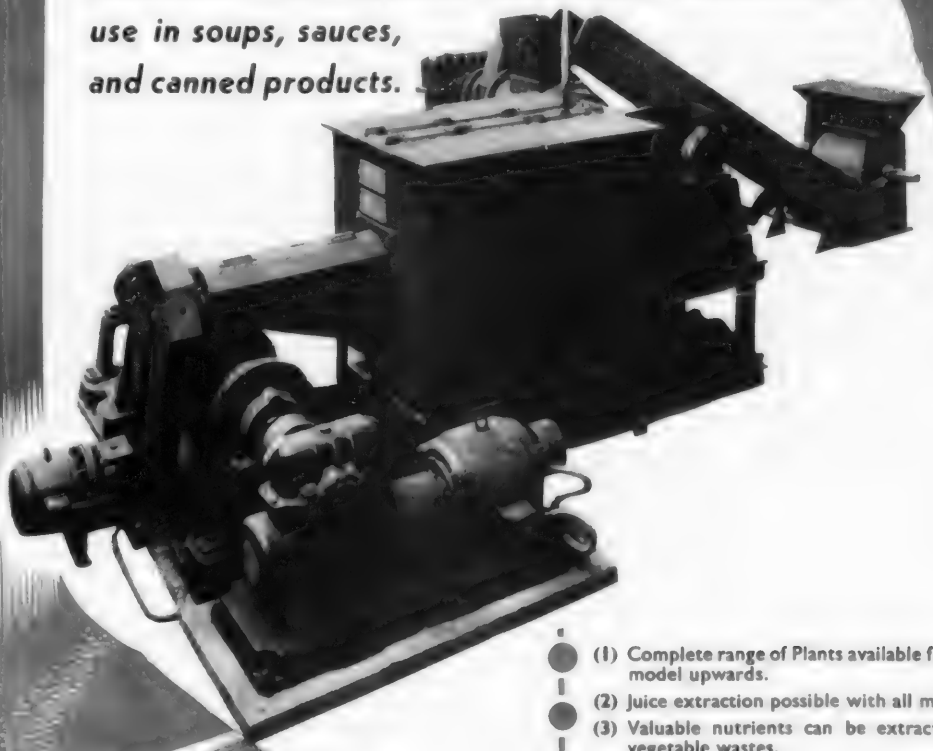

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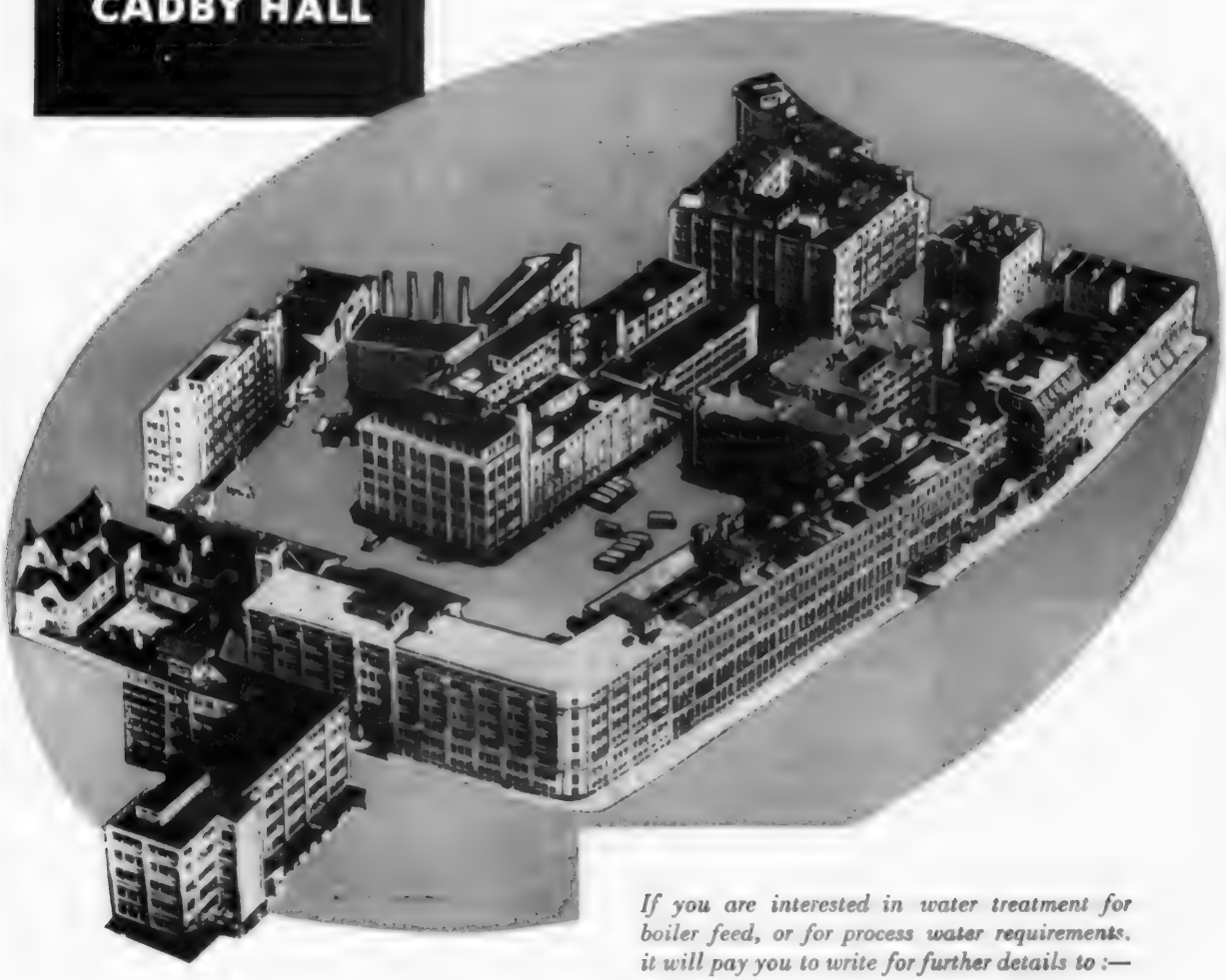

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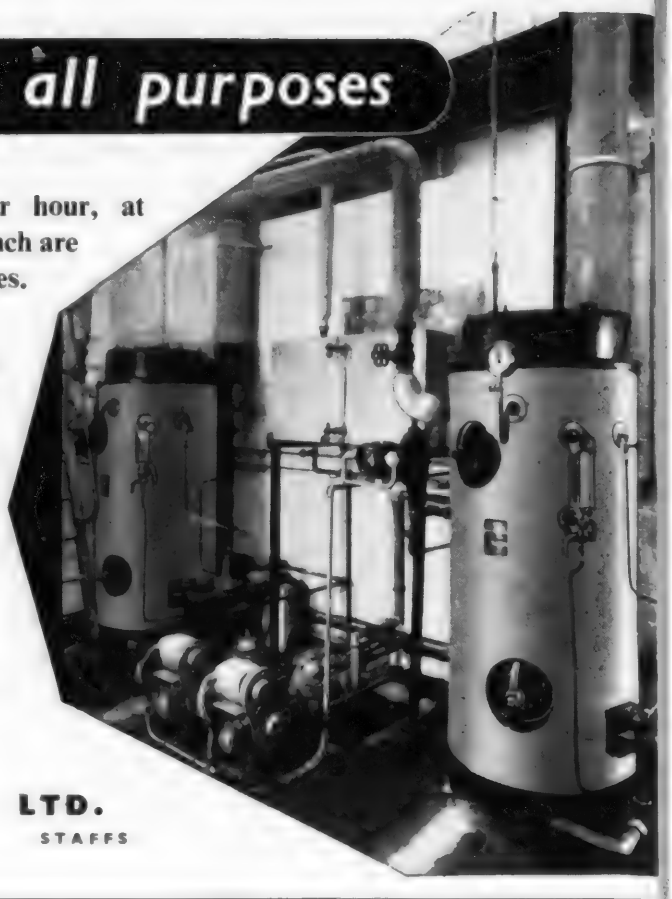

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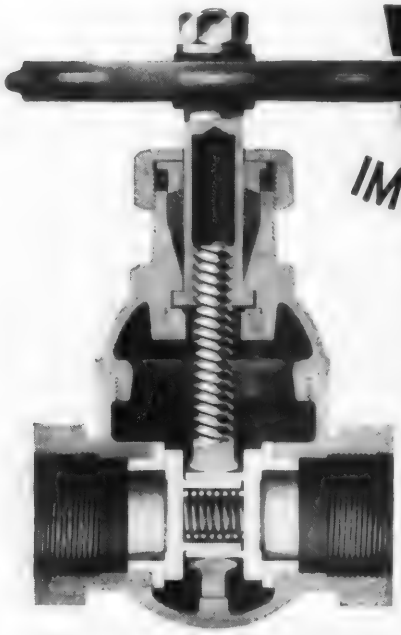

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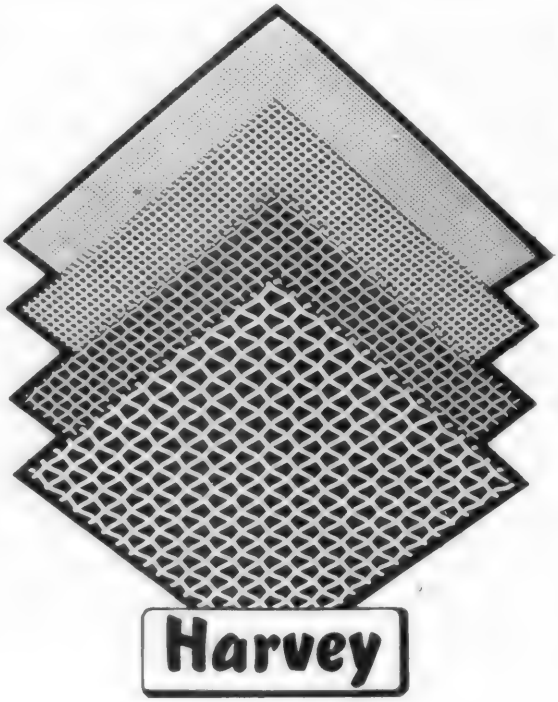

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May we show you this 15-minute film on your own desk?

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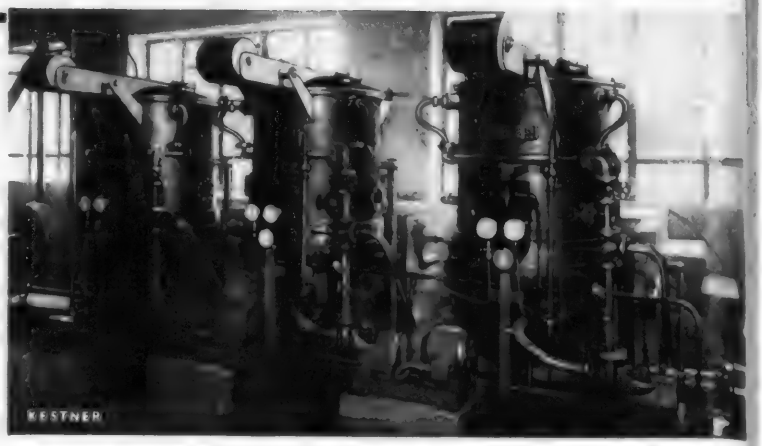

Battery of Kestner Coffee Extractors installed in model factory recently erected in Southern England

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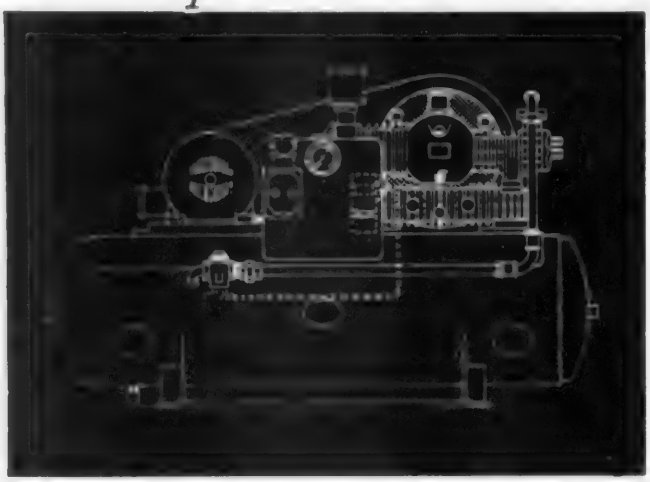

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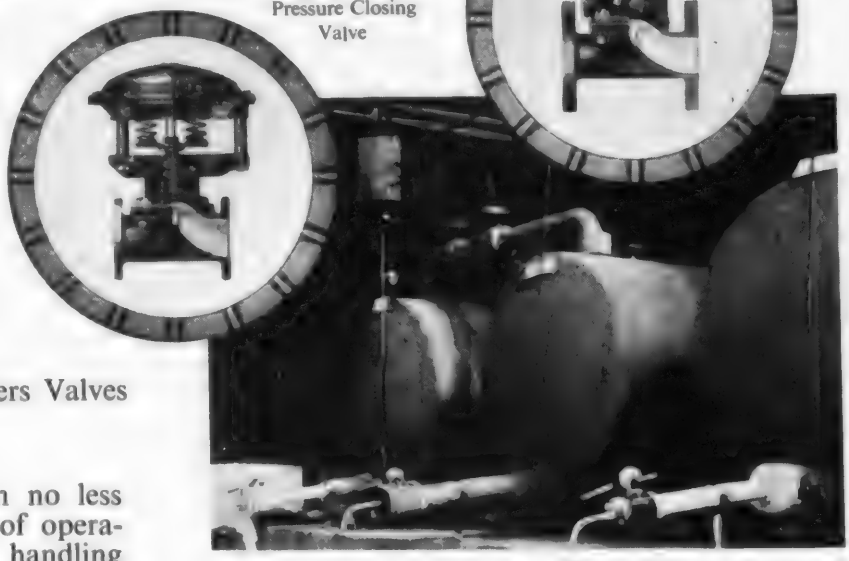
employed in the manufacture of Phosphoric Acid

Lever Operated (Quick Acting) Valve

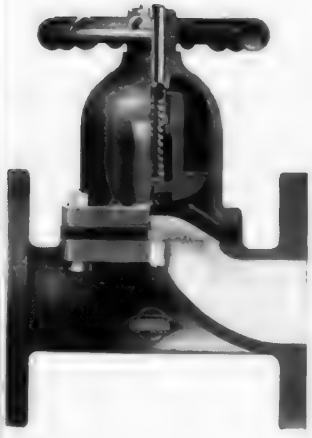
Diaphragm Operated Pressure Closing Valve



Photograph by courtesy of Messrs. Albright & Wilson Ltd.

This plant, unique in Great Britain, of which a small section is shown, makes extensive use of Saunders Valves for a variety of purposes.

In the illustration no less than four forms of operation are seen handling phospheric acid at 110°F. to 123°F. Quick Acting and Handwheel-Locking Piston Operated types occupy the foreground and above the tanks both Diaphragm Operated and Piston Operated Valves are used.



Elsewhere in the plant batteries of Handwheel Operated Valves handle moist air and water. Extended Spindles are employed where remote manual control is desired and a Padlocked Handwheel prevents unauthorised use at another point.

Here indeed is exemplary use not only of the Saunders Diaphragm principle but of many adaptations for its most effective applications.

Study of the Saunders Technical Handbook will suggest still wider and more profitable usage in YOUR plant.

SAUNDERS VALVE COMPANY LIMITED

DIAPHRAGM VALVE DIVISION

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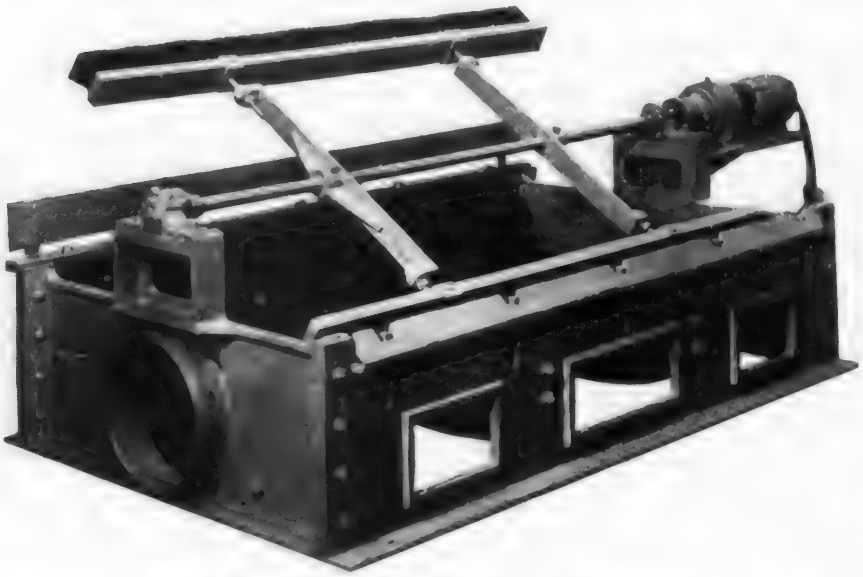

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★ **Considerable saving in steel, both in collector and supporting structure.**

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★ **High dust collecting efficiency.**

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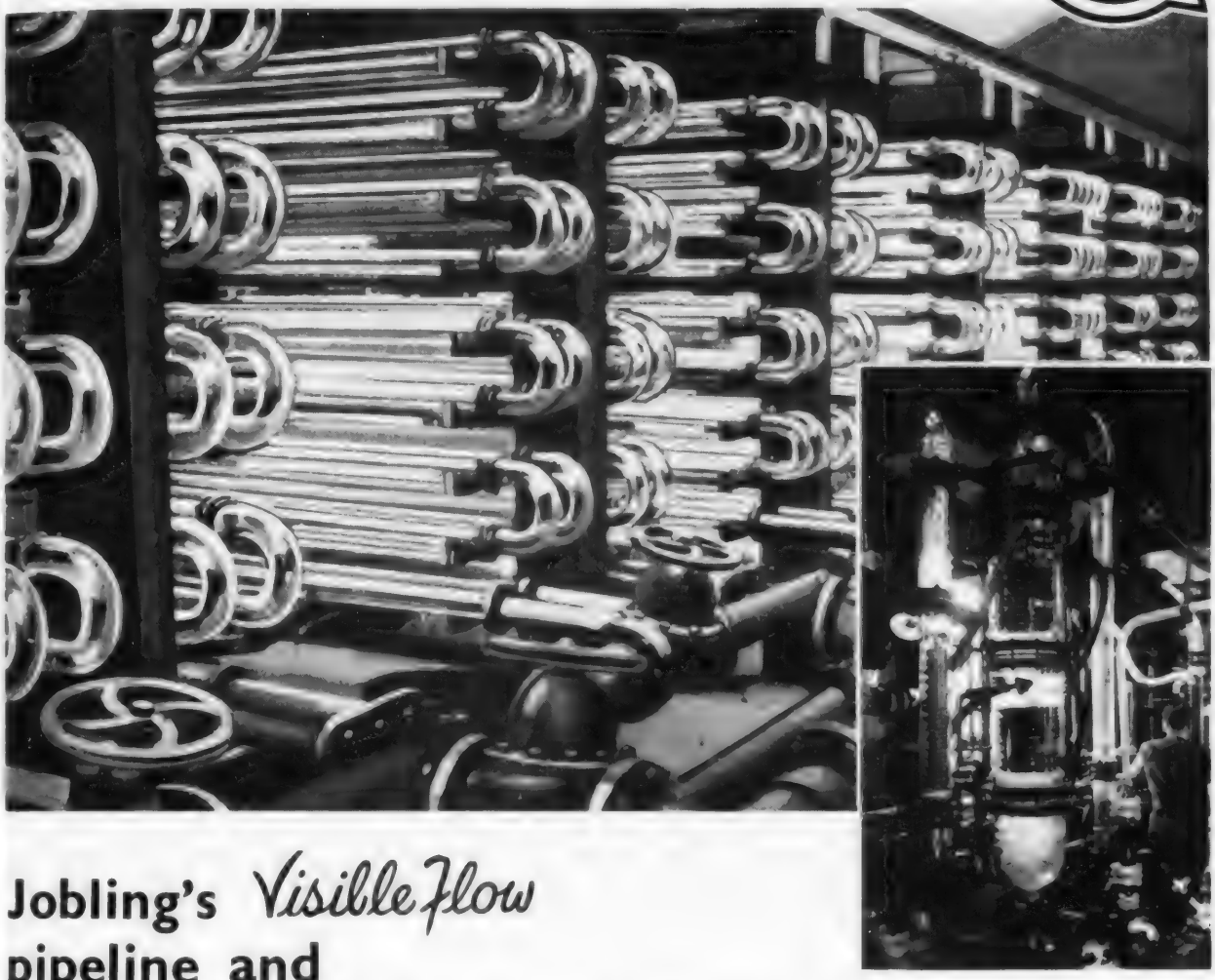

Jobling's *Visible Flow* pipeline and "Quickfit" Industrial Plant in "Pyrex" glass

are now being marketed solely through Q.V.F. Ltd., Mill Street, Stone, Staffs. Products of both Jobling's and "Quickfit" are made from "Pyrex" brand glass and they can be built into complete Industrial Units for the service of industry the world over.

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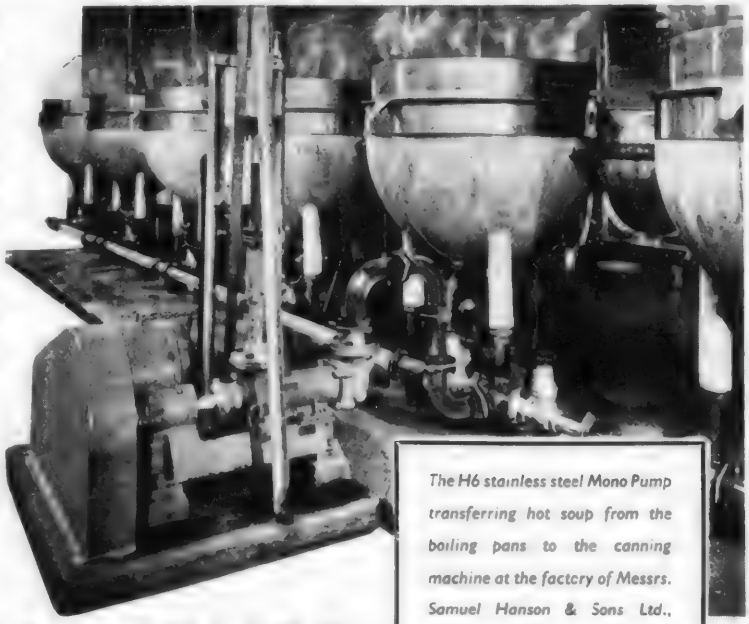

The H6 stainless steel Mono Pump transferring hot soup from the boiling pans to the canning machine at the factory of Messrs. Samuel Hanson & Sons Ltd., at Toddington, Gloucestershire.

The MONO pump

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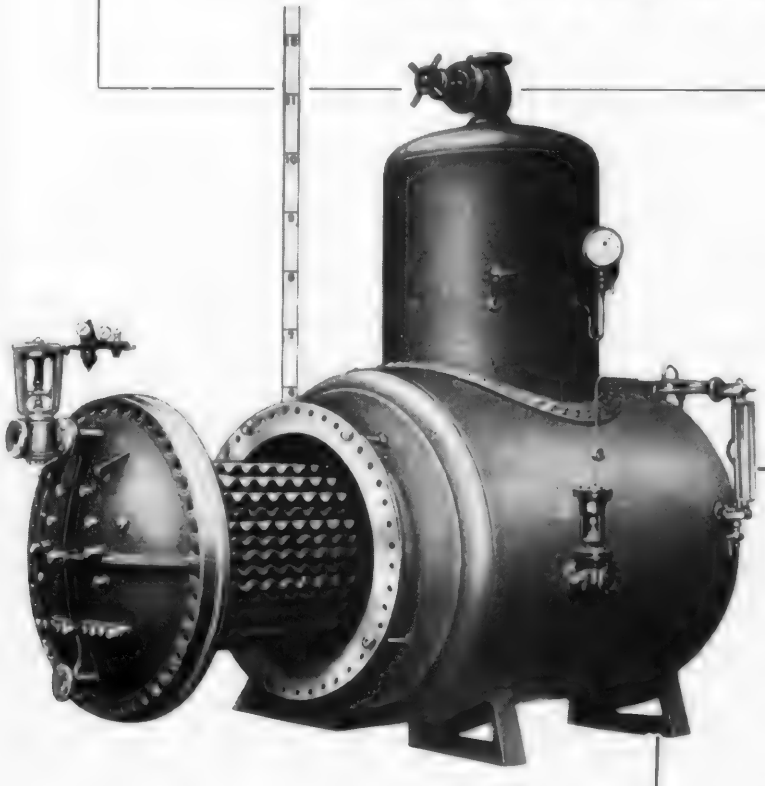

Illustration *shows a Generator designed to generate 7,000 lbs. of steam per hour at a pressure of 120 p.s.i. using as the primary heating medium, steam at a pressure of 300/350 p.s.i. and temperature 750° F.*

Each Generator designed by specialists to meet the conditions applying in each particular case. Heating medium may be steam or high pressure hot water. "Double Efficiency" of the indented tubes, forming the heating surface, ensures compactness. Operation fully automatic.

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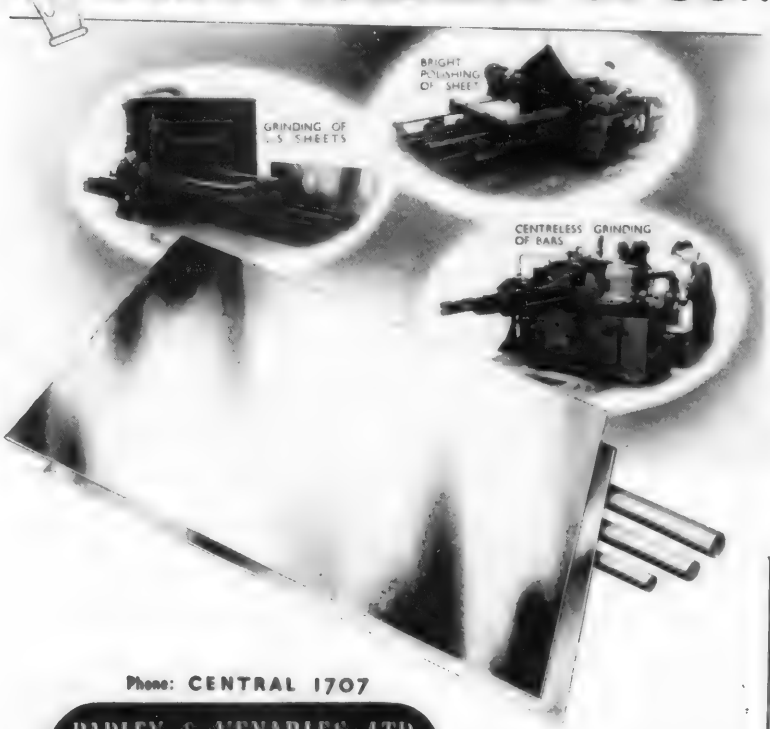

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In steam-heated processes better heat transfer will always give a higher rate of output or reduced costs.

Spirax methods improve heat transfer by reducing the thickness and resistance of the stagnant films of water and air on the condensing surfaces:

1. *By "individual steam drying"; small Spirax Steam Separators at the inlets to process units to ensure good dry steam for each individual unit;*

2. *By air-free steam; Spirax Automatic Air Vents at the correct venting points on process units, to discharge the bulk of air on starting and whenever air collects during running;*

3. *By high-efficiency steam trapping; the right Spirax Trap, correctly chosen for the job and fitted in the correct position, to discharge condensate effectively under all conditions at the rate at which the job demands.*

Spirax give also specialist advice on condensate recovery systems, flash steam recovery systems, and steam metering (at the boilerhouse or to departments or individual processes).

Please use the request slip.

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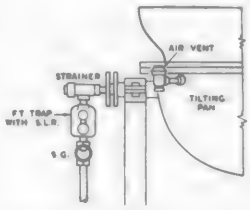
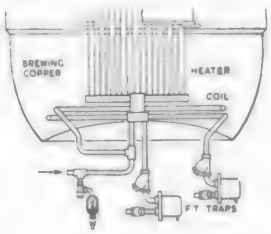
Spirax Steam Trapping and Automatic Air Venting methods for boiling pans give improved producion economy.



CONCENTRATING VESSELS

Spirax Steam Trapping and Automatic Air Venting methods for better heat transfer in large concentrating vessels.



TEMPERATURE CONTROL

Almost all heating or cooling processes in food manufacture, preservation and storage can be operated better and more economically by making temperature regulation automatic.

But only comparatively few processes need anything elaborate in temperature control devices. For the majority, thermostatic control in its simple direct form is adequate, sensible and inexpensive.

Sarco controllers have these advantages:

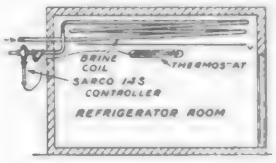
1. *Self-contained and self operated; no electricity or any other auxiliary power required;*

2. *They utilise the great power of hydraulic expansion; this self-generated force is exerted* **directly** *upon the regulating valve;*

3. *Operating power is uniform, per degree of temperature change, over the whole temperature scale, giving the same powerful direct valve operation at refrigeration temperature as at high temperature.*

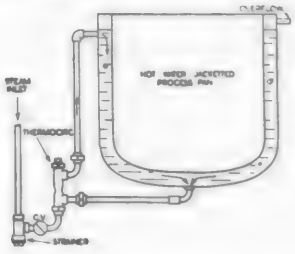
Sarco Regulators for heating or cooling operations (steam, water, brine) and certain gas and oil applications; Sarco Blenders for mixing hot and cold liquids; Sarco Diversion Valves for recirculation and control of engine cooling-water temperature.

Please use the request slip.



REFRIGERATION PLANT

Sarco Temperature Controllers give fully effective (direct-acting) operation at refrigeration temperatures.



JACKETED VESSELS

The Sarco 'Thermocirc' is a water-heater and temperature control for jacketed vessels and hot-water tanks.

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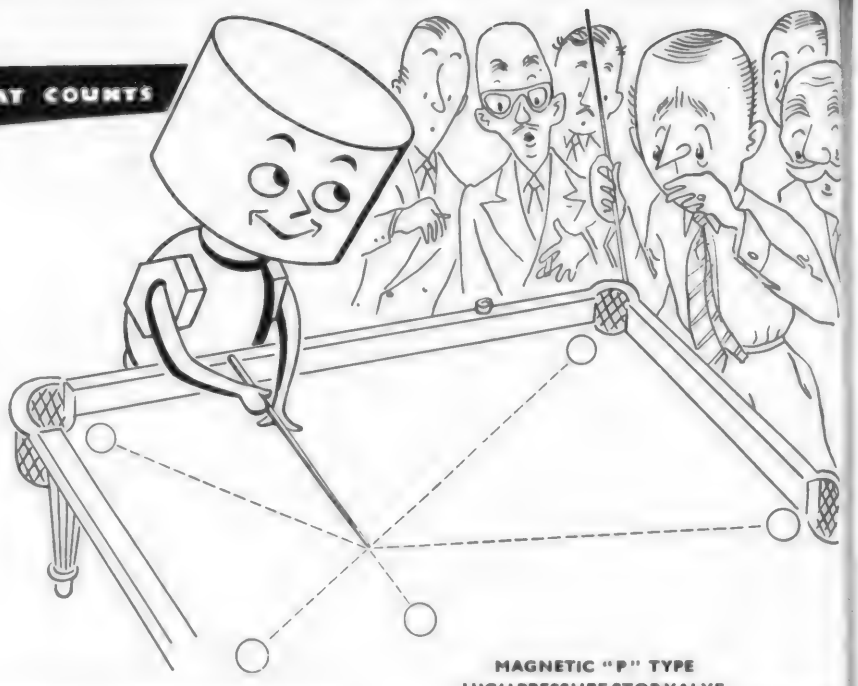

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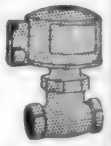

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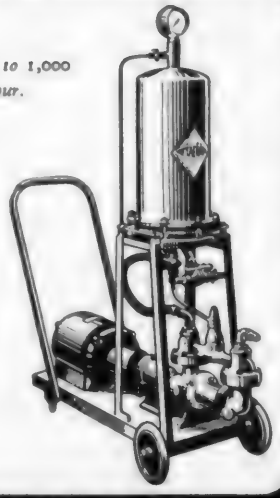

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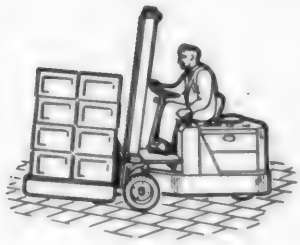

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FOOD MANUFACTURE

Vol. XXIX. No. 1 · Published Monthly · January 1, 1954

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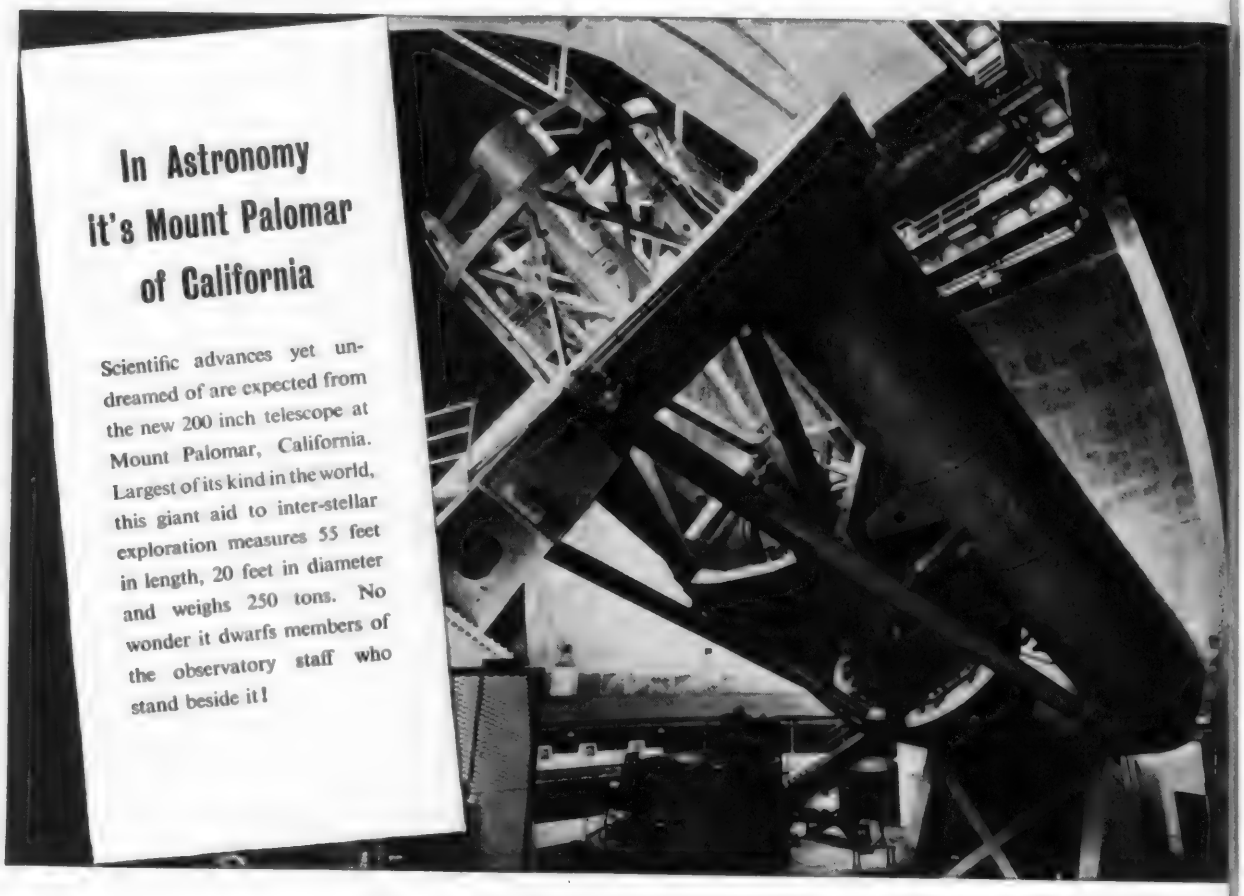

In Astronomy it's Mount Palomar of California

Scientific advances yet undreamed of are expected from the new 200 inch telescope at Mount Palomar, California. Largest of its kind in the world, this giant aid to inter-stellar exploration measures 55 feet in length, 20 feet in diameter and weighs 250 tons. No wonder it dwarfs members of the observatory staff who stand beside it!

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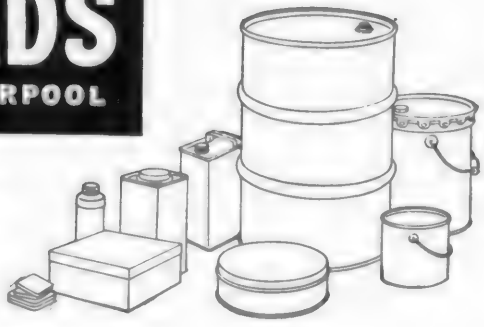

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FOOD MANUFACTURE

Vol. XXIX, No. 1 January 1, 1954

To all our friends at Home and Overseas
We send our New Year Greetings

What is Glucose?

IN his annual report for 1952, Mr. A. L. Williams, Portsmouth's Public Analyst, calls attention to the confusion produced by the use of similar names for two substances of widely different composition. The name "glucose" is used by food manufacturers to describe a sweet syrup obtained from maize, potato, and other starches, called commercially corn syrup, starch syrup, or starch sugar. It consists of a mixture of dextrins, maltose, and grape sugar in varying proportions, usually from 40 to 50 per cent. of the first-named. On the other hand, the term glucose is widely used to describe pure grape sugar, or dextrose, recommended by the medical profession because of its valuable therapeutic properties.

In the course of his duties, Mr. Williams examined a number of products labelled, or advertised as, for example, "Glucose for Energy," "Made with Glucose according to medical requirements." In a few cases the products were all dextrose but too frequently they contained only about 30 per cent., the rest being starch sugar. Since the average purchaser knows only of the pure medicinal glucose sold by pharmacists and grocers, the unqualified use of the name "glucose" on food labels is likely to be misleading.

Now is the time to adopt two names for these substances—names which will have some meaning to the general public. In pharmacy they are distinguished by qualifying adjectives, *viz.* "Liquid Glucose" for starch syrup and "Purified Medicinal Glucose" for dextrose.

Under the Labelling of Food Order, a Food and Drugs Authority may object to the use of the unqualified description glucose for starch syrup and may insist that a label shall give either the three constituents, dextrins, maltose, and dextrose, or the B.P. official name "Liquid Glucose," but obviously the addition of the adjective "liquid" has no significance to the layman, and it will not be possible to tell him what he is buying until the Pharmacopoeia Commission can be persuaded to delete it as an official name for the unpurified product of the hydrolysis of starch, and substitute one such as Corn Syrup, Starch Syrup, or Starch Sugar.

The use of the title "Liquid Glucose" in the B.P., together with the official statement that "it consists of a mixture of dextrose, maltose, dextrin, and water," implies that the major constituent is dextrose, whereas, in fact, dextrins are present in the highest proportion.

Although it is felt that Liquid Glucose is an unsatisfactory designation, a number of manufacturers have been advised that they must use this description for starch syrup when it is an ingredient in food, not because it is more informative but rather to establish that glucose is a generic term with no specific meaning.

Starters for Cheddar Cheese

THE examination of a number of mixed cheese starter cultures has been carried out by J. Czulak of the Dairy Research Section, C.S.I.R.O., Melbourne (*Aust. J. of Applied Science*, 1953, **4**, 462).

As a potential cause of openness, *Str. diacetilactis* appears to be a more dangerous organism to include in starters for Cheddar cheese manufacture than the leuconostocs, which also produce diacetyl, since the latter are non-acid producing and must always play a subsidiary role, while *Str. diacetilactis* can, and obviously in some cases does, become the dominant species.

Judging by the isolation of its phages from the whey when mixed starters are used, *Str. diacetilactis* appears to be subject to attack by phage in the same way as *Str. cremoris*, or *Str. lactis*, if operated for some time in a cheese factory. The specificity of the phages for *Str. diacetilactis* suggests that these organisms could be used as additional types where starter rotation is practised as a protection against

phage attack, provided openness is not a serious defect in the type of cheese for its particular market.

The gas production by *Str. diacetilactis* has virtues in the production of casein, causing the curd to float, and some of the strains isolated have in fact given very successful results in commercial casein manufacture. Where cheese and casein are made in the same factory, the use of a diacetilactis culture for casein must also reduce the risk of cross phage infection that might occur between the casein and cheese sections of the factory.

Pressed Meat

FOLLOWING the outbreaks of food poisoning in Leicester in 1951 caused by staphylococcal toxin in pressed meats, inspection of a number of premises where pressed meat products were prepared showed that the methods used were defective in many ways. It was therefore decided to investigate the preparation of products such as brawn, tongue, and pressed meat, which are eaten without further cooking.

A thorough inspection of general conditions in 20 Leicester premises was made, followed by further visits when samples were taken for bacteriological examination.

The results of these investigations have been described in his latest report by Dr. A. I. Ross, Deputy Medical Officer of Health, Leicester.

The findings, based on inspection and bacteriological examination, showed that unsatisfactory conditions existed in some cases.

In a report published in 1950, the Manufactured Meat Products Working Party recommended that "the final cooking should take place after the tongue or other meat has been placed in the mould in which it is to be pressed; manufacturers with facilities for cooking by steam will have no difficulty in doing this and others using open cookers should, whenever possible, modify their practice to secure the same result. At all times contact with the hands after cooking should be reduced to a minimum."

Whatever method of cooking is adopted, the meat has still to be handled when taken from the boiler and placed in the moulds.

To avoid this, Dr. Ross devised an aseptic technique by which the meat is cooked in the usual way or placed in the boiler in a large colander. All moulds, lids, knives, forks, etc., and a small bucket or jug, are boiled or steamed for at least 10 minutes. The operative wears clean protective clothing, *i.e.* washable head covering and a gauze mask over the nose and mouth. The use of a mask prevents contamination by organisms from the nose and mouth, and of the hands by staphylococci which may be in the nose; it also serves to remind the operative that the preparation of pressed meat is a very special process.

After 10 minutes the bucket or jug is withdrawn from the boiling water—wooden laundry tongs have proved useful for this purpose, the gripping end having first been sterilised by boiling—and filled with boiling water to which a measured amount of hypochlorite to make a solution containing 100 parts per million of chlorine is added.

The other knives and forks are then placed in the bucket with the handles projecting. Using the tongs, a mould is taken from the bucket, inverted, shaken, and placed on a table. After trimming on a sterilised tray or in the colander, the meat is filled into the mould. After each instrument is used it is returned to the hypochlorite solution.

When the meat contains a quantity of gristle or bones, as in the case of tongues which have to be skinned and boned, the meat can be partly cooked, trimmed, re-cooked to sterilise, and then placed in the moulds, using the method described.

The technique has been adopted successfully by several Leicester concerns without any significant increase in the time taken for the work. A special pair of tongs has been designed by Dr. Ross, but they are not yet generally available, as it has not been possible to find a manufacturer willing to produce them.

Transparent Cellulose Film

CRITICISM has been levelled against film manufacturers during the past year by users of transparent cellulose film who were unable to obtain their full requirements, but according to the collective views of the industry, it is unreasonable to blame only those whose chief aim is to make and sell their product.

The present difficulties can be regarded as a reaction from the recession which affected industry generally during 1952. As far as the cellulose film industry is concerned, the extent of that recession can best be illustrated by the sales figures. In the first quarter of 1952, deliveries of cellulose film to all markets totalled 5,700 tons—the highest quarterly rate ever recorded. In the second quarter, deliveries had dropped to 3,900 tons, and in the third, they were reduced yet again to 2,900 tons, representing a reduction of 49 per cent. within six months.

The chief reasons for this sudden change were the tightening of import restrictions in several countries, particularly Australia—the largest single export market for U.K. cellulose film—and the fact that many users allowed their stocks of film to drop dangerously low, in the mistaken belief that the price would fall.

With sales almost halved, the film manufacturers were reluctantly forced to reduce output; at the same time, they began to look around for new customers to move at least some of the film not taken up by existing users in the U.K. or made available by the loss of export trade. Paradoxically, at a

time of apparently diminishing demand, the number of firms willing to start using film for the first time or to start using it again, was considerable, and led to some important new packaging developments.

The downward trend of film sales has now been reversed; during the last quarter of 1952, sales were greater than in the previous period and this recovery has since been maintained, with sales in the first half of 1953 running at a record level. Even more significant is the fact that supplies to the home market are greater than ever before.

The industry is now faced with two partly conflicting problems: it is trying to satisfy as quickly as possible the back-log of orders for re-stocking which has accompanied the general recovery of business; at the same time it does not want to lose the new customers who were able to take advantage of the freer supplies in 1952.

The "bottleneck" will go but what of the long-term position? Present plans envisage an increase in production of about 25 per cent. in two years' time. Moreover, the present trend for a greater proportion of sales to go to U.K. users is likely to continue as the manufacture of film increases in other countries. Thus increased production and the diminishing export demands will help towards solving the industry's chief problem.

There can be no quick solution to this problem of overall shortage, particularly since the basic production unit—the casting machine on which cellulose viscose is regenerated to form a continuous film—is very large and costly, and takes up to two years to install and get into production.

It is reasonable for users to ask for continuity of supplies, a condition which cellulose film manufacturers have often found it difficult to satisfy, but there are times when a manufacturer supplying many different industries with essential material can also expect some continuity of demand—even at a reduced rate. Without such continuity, the manufacturer of cellulose film can neither plan his production with confidence nor his distribution with fairness.

A New Nutmeg Oil

In view of the fact that the two oils from nutmeg, both the distilled and the expressed variety, are expensive, research work was recently carried out in India to find a cheaper product. As a result, a spicy oil has been obtained from the foliage of the nutmeg tree by steam distillation, the yield being about 0·5 per cent. of the foliage weight.

The investigation was prompted by the observation that nutmeg leaves interfered with the growth of many weeds, indicating that they might contain a weed-killing oil; this was found to be the case.

The oil has already been used in chewing gum and it is likely to be more generally used as a flavouring agent (*Science and Culture*, **19**, 4, 186). It should be possible to produce it much more cheaply than the nutmeg oils; foliage is abundant on nutmeg trees, which for good production should be pruned twice annually. Hitherto the sole use of the male tree has been for fertilisation, but now it can also be used for the production of nutmeg leaf oil.

Antimony Poisoning

In his consideration of antimony as a possible cause of chemical food poisoning, Dr. C. M. Brown, Medical Officer of Health for Manchester, in his annual report for 1952, points out that its occurrence, though rare, usually derives from the use of enamel-coated cooking utensils of poor quality.

It was Dr. Brown's opinion that it might be worth while completely to prohibit the use of antimony in such hollow-ware in the best interests of both the public and the manufacturers. To date, no such prohibition has been imposed in this country. The nearest approach exists in the Public Health (Preservatives, etc., in Food) Regulations, 1925-1940, wherein the colouring of food with antimony compounds is expressly prohibited.

The possible effects of the use of antimony pentasulphide as a common constituent of rubber tubing, bungs, and rings should not be ignored. Slightly acidic products, such as beer, wine, and lemonade, might dissolve significant amounts of antimony; if such rubber articles should come into close and prolonged contact with beverages and foods, some risk might occur.

The Arts Babblative and Scriblative

In his "Advice to Young Men," Dr. Watts wrote: "In promulgating your esoteric cogitations and in articulating your superficial sentimentalities, beware of platitudinous ponderosity. Let your conversational communications possess a clarified conciseness, a compact comprehensibleness and a concatenated cogency. Let your contemporaneous descantings and unpremeditated expatiation have intelligibility and veracious vivacity without rodomontade or thrasonical bombast. Sedulously avoid all polysyllabic profundity and pompous prolixity. In other words, talk plainly, briefly, naturally, sensibly and truthfully. Don't put on airs; say what you mean; mean what you say; and don't use big words."

Although this quotation relates to the spoken word, it is equally applicable to the theme of Mr. A. L. Bacharach's paper on "Writing Wrongs" read at the recent joint meeting of the Fine Chemicals Group and the London Section of the Society of Chemical Industry.

The subject does not at first sight appear to lend itself to coruscant persiflage, but Mr. Bacharach's

discourse was lightened by constant flashes of humour, much to the delight of his audience.

He described the pitfalls which beset the technical writer. He expatiated on grammar, which was the servant of language and not its dictator; on punctuation, construction, and idiom; on the exasperating occurrence in MSS. of the word "however" and similar abominations.

The discussion that followed bore witness to the interest evoked by the paper. Among the large number of points raised, one referred to Mr. Bacharach's categorical rejection of the short "i" in the pronunciation of the word "vitamin." One member said it was permitted by the Oxford English Dictionary. "In that case," said Mr. Bacharach, "the O.E.D. is wrong." Cold shivers went a-tingling down the spines of some of the older hands at such sacrilege!

For some reason, any discussion on the rights and wrongs of words often engenders the hardest of feelings and there were one or two who had anticipated that the meeting might develop into a "bullfight." If there were any pugnacious members present, they must have been disappointed; the admirable decorum customarily to be found at S.C.I. meetings was not disturbed.

Container Materials and Vitamin C

In 1949 the Federal Research Institute for Food Preservation in Karlsruhe started a long-term study of the losses of ascorbic acid in products kept in glass jars, in tinplate, and in blackplate cans; the recently published detailed report of the findings contains much data of interest to the canning industry. The investigations involved the determination of the ascorbic acid content, prior to processing and in the course of storage for two and a half years, of French beans, minced spinach, carrots, damsons, pears, and apple purée.

During sterilisation and the first 14 days of storage the vegetables lost 20 per cent. of their ascorbic acid and the damsons practically none, while pears suffered considerably. The drop in the ascorbic acid content of the vegetables did not continue throughout the whole period of the investigations, but was soon replaced by a slow but steady decline. At the end of the period the spinach still contained 60 per cent. of the ascorbic acid that had been found after the initial 14-day period; corresponding figures for other foods were: 70 per cent. for beans and only 20 per cent. for carrots and damsons.

In the case of beans and spinach, the loss of ascorbic acid was smaller in cans than in glass jars, and the blackplate can was actually superior to the tinplate to a slight extent. The nature of the container material had no effect upon the ascorbic acid content of carrots, damsons, pears, or apples.

The cause of the higher ascorbic acid loss in glass jars has given rise to much discussion. American workers have suggested that in iron-base containers the metal is oxidised by the free oxygen before the latter can destroy any considerable amount of the ascorbic acid, the iron functioning as an oxygen-sequestering agent. The German workers put forward the alternative theory that the catalytic action of traces of copper (present in the original products) on ascorbic acid oxidation is eliminated in the blackplate containers because of the precipitation of the copper by the iron.

In supplementary experiments the change in the total content of ascorbic and dehydroascorbic acids was investigated. It was found that the dehydroascorbic acid was very largely destroyed during sterilisation, no trace of it being found after an eight-week storage period in any of the foods used in the series of tests with apple purée, apple juice, spinach, and beans.

To What Base Uses . . .

One event of importance was not appreciated by the children of Bedford during the last war. Outside the sweet shops they gathered in indignant little groups. "Wot—no aniseed balls?" Things had come to a pretty pass, and the happiest days of their life were clouded by this almost unbelievable deprivation. No longer do these children, for they are grown up, respond to the lure of the aniseed ball, but they may be interested to hear of the cause of the catastrophe. This was brought to light at a recent sitting of the Royal Commission on Awards to Inventors concerned with the value of the limpet magnetic bomb and the clam magnetic time-bomb in demolition and sabotage work during the war.

One of the two originators of the bombs revealed that although chemists had produced many pellets with various chemicals in their efforts to find a substance which, though very hard, would dissolve at a regular speed in either fresh or sea water, none of the products of their labours had proved satisfactory. By accident, it was found that aniseed balls fulfilled all these requirements. When they dissolved, they released a striker that fired the charges that exploded the bomb, that presumably sank the ship that "Jerry" built.

Thus it was that the small boys and girls of Bedford unwittingly did their bit in the war.

TO AUTHORS

The publishers of FOOD MANUFACTURE and the other journals of the Leonard Hill Technical Group are prepared to consider the publication of articles and text-books on their various subjects.

The Irish Jam and Marmalade Industry

The sugar and jam industry in the Irish Republic has expanded considerably since the first census of Irish Industrial Production in 1926 when the gross output stood at slightly less than £880,000. Since 1936 this group of industries has increased its combined nett selling value by almost £10 million, rising from £4·2 million in that year to £14·1 million in 1948. The output of sugar has fluctuated considerably; in 1948 it amounted to just over 106 per cent. of the 1936 volume.

ONE reason for the large expansion in gross output of the sugar and jam industry is that the progress achieved in the production of sugar from home-grown beet has made Ireland almost self-sufficient in sugar supplies. During the war, shortages of certain lines of imported raw materials created considerable difficulty for the manufacturers, but in spite of this production was kept well above pre-war levels, and for many years firms like P. Kavanagh and Sons Ltd. have been meeting the full requirements of the home market for their products.

An aerial view of the Kavanagh factory.

The original premises of the firm were in Brabazon Street, Dublin. Following a fire, the present modern premises, Sunshine Works, were built at Crumlin Road, Dublin, in 1936.

Known as "The Factory in a Garden," the white fronted building stands on over three acres of ground and is surrounded by green lawns, gardens, and trees.

The present directors are Mr. P. J. Kavanagh (managing director), Messrs. John Shiel, B. M. Kavanagh, and John Ryan.

The firm manufacture jams and marmalades, with lemon curd, mincemeat, cured peel, and glacé cherries as subsidiary lines. A speciality is jelly marmalade. When making this product, the "hearts" of the oranges are first boiled in an autoclave and the resulting liquor blown by compressed air into storage tanks. Thence it passes through the first filter press—a series of canvas-covered plates—in which the solids are removed; the clarified juice is then passed through a further filter, from which it emerges sparkling and clear.

The sugar is treated in a similar way—a syrup of specified strength is made, filtered, and discharged into a container adjacent to the boiling pans, where an operative weighs and discharges, under laboratory control, the requisite amount into the boiling pans.

The white pith having been previously removed from the peel, the shreds are cut from the outside skins of the oranges and are cured by boiling with sugar solutions of various strengths. From the boiling pans, the marmalade goes through the cooling and then to the filling machines. Washed jars, dried by super-heated steam, are conveyed under the nozzle of the filling machines which are so synchronised that an exact weight is filled into each jar without the slightest deviation.

After capping and passing through a sterilising chamber the jars are stacked to cool off and subsequently labelled.

Fruit for jam making is purchased mainly from County Wexford, where growers cater especially for the firm's requirements, picking and packing under supervision so that only the finest fruit finds its way to the factory. The sugar used is produced at one of the four Irish sugar factories at Mallow, Thurles, Tuam, and Carlow. An extensive range of jams is packed varying in size from large tins for the bakery trade to ½ lb. jars.

In the peel and cherry department, the curing of orange, lemon, and citron skins is carried out, either candying or cutting. For the former, the cured caps of peel are immersed in a sugar solution which gives the familiar casing of sugar to be seen on commercial candied peel. A large trade is now carried out in cut peel, diced for immediate use. This is packed in large boxes for bakers and in 4, 8, and 16 oz. containers for grocers.

A full range of fruit squashes and cordials, provided with drinking straws, and bottled tomato juice, is also produced. In another

The sugar solution is prepared and filtered in a centralised plant.

Ham Canning

For ham canning, Kavanagh and Sons purchase freshly cured gammons, delivered in new, dry wood casks or boxes from bacon curers approved by the Department of Agriculture.

On arrival at the factory the gammons and containers are examined by the production manager and the departmental inspector. The gammons are then weighed into the chill room and held at 40°F. Thence they are taken, as required, for washing before boning. After skinning and defatting, the gammons are packed in cans suitable to their weight and size.

After being placed in the can, the ham is put through a hydraulic press, the lid of the can is seamed, and as an extra precaution to ensure that there are no leaks in the seams, they are soldered. The can is then vacuumed by machine before the final weighing. Finally, cooking in the retorts is carried out at various times and temperatures according to the size of the cans.

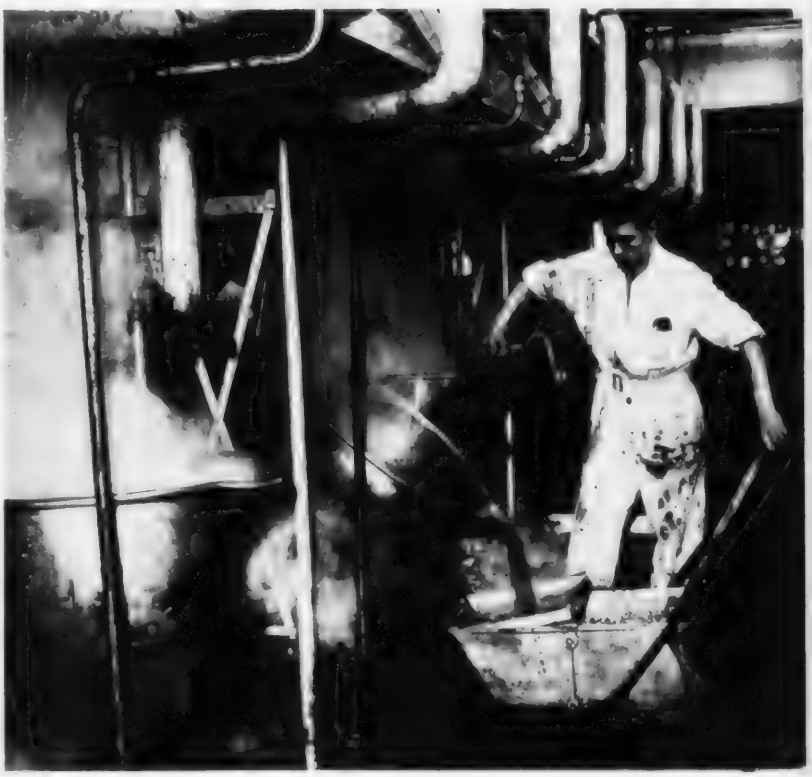
With the renewed development of the Irish bacon industry after its collapse from lack of imported feedingstuffs for pigs, canned ham

department, rendered dust free by a system of exhaust fans, custard powder, cornflour, baking powder, egg substitute, and ice cream powders are manufactured. In an adjacent room table jellies are made and packed.

A further section of the factory is devoted to canning. Export business in these lines made imperative a large extension to the existing premises, a completely new refrigeration plant having been installed to deal with the 400 cattle which arrive at the factory during the week.

Large quantities of frozen beef are sent to the U.S.A., while stewed steak and canned hams are sold to production capacity in the U.K. The Department of Agriculture exercises a rigid check on all produce destined for export, inspectors examining both the raw materials and the finished product.

Samples are taken from each batch and sent to the State Laboratories for examination.



Discharge of the jam from the boiling pan.

Above: **The crates of sterilised jars pass by conveyor to the automatic jam filling machine.** *Below:* **After capping, the jars of jam are stacked to cool off prior to labelling and storing.**

is again becoming an important Irish export.

Tinned beans in tomato sauce, peas, and other vegetables are all processed, while various lines of pickles and stuffed olives are bottled.

In the despatch department of the factory the orders are assembled near the loading bay which allows the fleet of vans to pull in under shelters to floor level where loading may be done with a minimum of effort and time. The company's sales service covers the Republic, where the firm has developed a big home market for its products.

Staff Welfare

Over 350 people are employed, all of whom, including the managing director, have to pass a medical examination every two months. A well-equipped surgery has a doctor and dentist in attendance each week, and chemical and bacteriological control is conducted in the laboratory—one of the first to be installed in Ireland.

Top: **After cooling, the jars of jam are automatically labelled and then stored.**

Bottom left: **The jam is packed in wooden or cardboard crates prior to despatch.**

Bottom right: **A well-equipped surgery has a doctor and dentist in attendance each week.**

Juice making plant for the preparation of cordials and fruit squashes.

Incentive bonuses enable factory personnel to augment their regular income and each week there is a meeting of the Works Committee composed of members of the staff from all departments who discuss matters of mutual concern with the management.

Today, the Irish jam and marmalade manufacturers are obliged to be in a position to enter external markets on a highly competitive basis. This is a development the Irish Government has been willing to support, recognising that only by increased employment and an expanded trade position abroad can results accrue. One relief introduced by the State was the reduction in the price of sugar which became operative for manufacturers last June. During the difficult formative years of the Irish industrial revival, the industry gave evidence of its tenacity and resourcefulness; it has realised the importance of the home market as the basis for the drive for exports and has shown that the best way to develop that market is to raise the workers' living standards.

It is helping Ireland, also, to create a tradition as an exporting country. Its overseas markets, though not considered merely the receptacle for surplus production, have become supplementary to a home market. The special requirements of foreign buyers, in so far as the flavouring, packaging, and labelling of their products are concerned, are also receiving the attention of Irish food manufacturers.

SUPPLIERS OF EQUIPMENT

Sugar melting and filtration plant: *The A.P.V. Co.*
Jam filling machines: *Mather and Platt.*
Jam capping machines: *Hunter of Rugby.*
Sterilising machine: *Mather and Platt.*
Hydraulic press and solder bath: *Square and Co., Copenhagen.*
Vacuum soldering machine: *Premier Filterpress Ltd.*
Juice-making and pectin plant: *Robert Kellie.*
Jam boiling pans: *Brierley, Collier and Hartley.*
Jam labelling machine: *Purdy Machinery Co.*
Refrigeration: *Frigidaire.*
Scales: *W. and T. Avery.*
Vehicles: *Collis Trucks.*

FUTURE ARTICLES

AMONG the articles to be published in forthcoming issues are: "Three Centuries of Brewing," "The Passion Fruit," "American Flavours for Soft Drinks."

Fruit Growing Research

THE importance and conservation of soil moisture and the irrigation of strawberries and top fruit were dealt with at a recent Members' Day at East Malling Research Station.

Dr. F. R. Tubbs, the Director, stressed the importance of close contact between research worker, grower, and National Agricultural Advisory Service, and referred to some of the ways this contact was being maintained.

Dr. W. S. Rogers, head of the Pomology Section, reviewed the role played by soil moisture in plant growth. He explained how water was held in the soil and pointed out that only a proportion of the total soil water was available for the plant and that this amount varied with the depth and texture of the soil. He showed how the available water could be estimated by means of a soil moisture tensiometer, developed at East Malling, and also by means of calculations based on meteorological data, using the formula devised by Dr. Penman of Rothamsted.

How the water requirements of the plant throughout the season usually exceeded the amount of available water was discussed by Mr. J. E. Goode, who described an experiment which showed how the available water was influenced by management factors, especially straw mulch, clean cultivation, and grass sward.

After lunch Dr. Rogers surveyed earlier trials of irrigation at East Malling and led up to the present series of experiments, which were the most comprehensive yet attempted.

Miss Dorothy J. Wilson dealt with the irrigation of strawberries. From her experiments she considered that in mid-Kent it was well worth while to apply ½ to 1 in. of water whenever the soil moisture deficit exceeded 1½ in. in May or June. This was likely to occur after 10 to 14 days without appreciable rainfall.

Two experiments on the irrigation of apples started last year were described by Mr. Goode. The chief effects had been an increase in girth under moderate watering and an indication of an increase in fruit size by both water and nitrogen.

The Nutritional Significance of Vitamins

THE science of nutrition is primarily concerned with food and its various ingredients, and with the way in which each of these is utilised or discarded by the body. For over 100 years scientists have recognised the importance of the nitrogenous constituents of the diet for building tissue, and of the fats and carbohydrates as "respiratory substances," yet our knowledge of the processes by which these dietary factors are utilised is still very far from complete; indeed the results of recent investigations have shown that many of the transformations that take place within the body are far more complicated than was formerly supposed.

Nutrition from All Angles

Although many books and reviews dealing with special aspects of the biochemistry or physiology of nutrition have been published in recent years, the book under review* is a unique attempt to survey the field as a whole, and the editors were clearly aware of the difficulties confronting them.

In the first place, the subject is so vast and is advancing so rapidly that the only way in which there was any hope of achieving the desired result was to apportion the work between specialists with expert knowledge of each field. In the second place, the editors obviously wanted to avoid duplication with existing up-to-date publications and therefore excluded material which is readily accessible elsewhere—a realistic and commendable attitude when the time available for reading is so limited and the amount that should be read apparently without limit! As a result of this policy the book undoubtedly suffers; instead of being a systematic comprehensive treatise following a uniform pattern, it is a rather uneven miscellany of isolated monographs, each one excellent in itself but bearing no particular relationship to any of the others.

After a brief outline of the way in which nutrition as a science has developed, there is a short history of the vitamins, followed by a chapter on water and electrolyte metabolism, particularly welcome because this is a relatively neglected field. Next comes a clear and concise account of carbohydrate metabolism, followed by two chapters on the amino acids and the biosynthesis of proteins respectively. These chapters are all concerned with subjects on which important discoveries are reported in almost every issue of the appropriate journals, and one of the valuable services rendered by the authors of these chapters is to indicate where the gaps in our present-day knowledge lie. With the proteins in particular, practically nothing is known of the way in which they are built up from the constituents of the diet, although with the aid of radioactive isotopes and of new *in vitro* techniques a start has been made in exploring this extremely difficult territory.

Lipid Metabolism

The chapter on lipid metabolism is longer than those that precede it and, either because this has given the author more scope, or else because this subject is less frequently reviewed, this is one of the most satisfying chapters in the book. The section on the nutritional implications of the lipids answers a number of questions about the function of lipids that had until recently been quite obscure, although at the same time poses just as many new ones.

The remaining four chapters are all concerned with vitamins and it is here that the unevenness of the book is most strongly in evidence. The chapters on the fat-soluble vitamins and on the vitamin B complex are straightforward factual accounts of the vitamins and their nutritional significance with very little detail, although the topical subject of intestinal synthesis of vitamins is dealt with rather more fully. The final chapters on vitamin C and on vitamins and haematopoeisis are longer and concerned much more with detail.

Most of the chapters are well documented and contain a large number of references to the original literature. The book is an Anglo-American venture, the authors being about equally divided between the two countries; in consequence, the results recorded by research workers on both sides of the Atlantic receive adequate recognition. The book is well printed, although there are a few minor errors. At first sight the index appears to be comprehensive, but a few samples taken at random showed that some entries are not in alphabetical order while some important references have not been indexed at all, even though in some instances an appropriate entry already exists. This is a minor criticism, and all who wish to understand the effect on nutrition of recent developments in biochemistry and physiology should read this book.

Gaps in Knowledge

Nutritionists are not unnaturally preoccupied with measuring the amounts of carbohydrates, vitamins, minerals, and so on in foodstuffs, and biochemists with investigating the fate of pure sugars or amino acids in isolated tissues or enzyme systems, but here we are concerned with the region where the two groups of workers meet. One day it may be possible to indicate the complete mechanism whereby the fats and starches in the food are broken down, absorbed, metabolised, and converted into energy and the manner in which the infinite variety of animal and vegetable proteins we consume are converted into the equally bewildering variety of proteins that constitute the tissues, blood elements, chromosomes, and antibodies of the human body, not to mention the viruses and tumour tissues that may ultimately bring about its destruction.

There are still great gaps in our knowledge and the value of a book such as this is that it helps us to visualise where these occur as well as providing us with a general picture of what is already known.

—F. A. R.

* *Biochemistry and Physiology of Nutrition.* Vol. I. Edited by Geoffrey H. Bourne and George W. Kidder. Pp. 569 + xiii. Academic Press. Price $13.00.

The Baking Industry

Progress in 1953

S. Walter Butterworth, B.Sc.(Tech.), F.R.I.C.
Birkett & Bostock Ltd.

With the introduction of fortified white flour, the abolition of sugar rationing, and the accelerating rate of disappearance of other Government controls, the baking industry was given more freedom to compete with increasing supplies of other foods in 1953.

THE floods on the East coast early in February were disastrous to all those immediately and directly affected, and their cost to the country is still incapable of being accurately estimated. They once more revealed the fundamental differences between the necessities and the luxuries of life. Food, clothing, and shelter were needed, and bread supply again became a vital matter; it seems to be only on troubled occasions such as those that an unassuming and unpretentious daily service is not taken for granted.

Coronation year started badly from a meteorological point of view, Coronation Day itself being far removed from the June weather everyone had hoped for. There were minor repercussions among bakers because bread and cakes continue to be eaten during public holidays, and another day of festivity implies increased activity behind the bakery scenes. The mountainous difficulties anticipated were reduced to the usual molehills when looked at after the event.

Revision of Subsidies and Orders

Soon after the Coronation, the bread subsidy was raised to "the record high level of 42s. 7½d. per sack—six times what it was only five years ago." The removal of the flour subsidy contributed substantially to this.

At the end of August the Flour Order and the Bread Order were revised. National bread continued to be subsidised and the maximum price remained at 7½d. per 1¾ lb. loaf. Unsubsidised white flour, fortified with vitamin B, nicotinic acid, and iron, as recommended by the Post-war Loaf Conference, became available.

Price controls on flours, including national flour, were removed and *creta praeparata* at the rate of 14 oz. per 280 lb. sack continued to be added to all kinds of flour "except true wholemeal flour produced from the whole of the wheat grain without any additions whatsoever." Thus the one type of flour which, on nutritional grounds, most needed a calcium addition, was exempted.

Ministries work in a curious way their wonders to perform. Perhaps, if the wholemeal were stoneground, the normal wear and tear on the stones would be thought to be a sufficient and suitable addition to "the whole of the wheat grain without any addition whatsoever." Those who adhere to the "it's natural—therefore it must be good for you" school of dietetics can swallow, among other things, a good deal of inconsistency. Prof. Yudkin has pointed out that the skin of the banana is usually rejected before the fruit is eaten; he might have added that deadly nightshade is as "natural" as wheat.

Flour Imports

The revision of the Flour Order and the Bread Order also permitted the import of flour; Canadian flour in particular again began to assume its pre-war importance. Bakery laboratories once more saw curves drawn by their dough-testing equipment, the shape of which they had almost forgotten; weak winter wheat curves at 14 gal. water absorption levels, and long, bold, never-ending curves from Northern Springs at 17 gal. and more.

The blending of flours to suit bakery needs at competitive prices became again a useful laboratory activity. With world wheat stocks at a high level after good harvests and falling wheat prices, there was little forward flour buying towards the end of the year. Changes of flour prices, discounts for large scale purchasing, and variations in delivery charges again caused much controversy about the bread subsidy system which was once more alleged to be inequitable as between large and small bakers.

Sugar and Fat

In the autumn, sugar was freed from rationing after 13 years' control and prices showed a downward trend. The sales of sugar confections steadily rose after sweet rationing ended; Board of Trade figures for September showed a 27 per cent. increase over 1952 in the sale of sweets and chocolate while bakery sales were 16 per cent. lower—no question about "competition with other foods." Fat allocations were drastically cut in February from 75 to 42 per cent. of datum but the allocation was improved in August to 60 per cent. Prices of basic oils and fats were raised in November by amounts up to £9 per ton according to variety.

There is every sign of decontrol of fat in 1954 and the return of branded lines will be welcome—after years of Marcom. The quality of unbranded bakery compound cooking fats and margarines has been far from satisfactory; competition between fat manufacturers should help the baker to get a better as well as a more uniformly reliable primary raw material.

It is doubtful whether the dollar situation and the world supply of fats will enable a full return to be made to pre-war conditions, but any alleviation of the present situation will be useful.

Dried Fruit

Dried fruit was decontrolled early in December, again after more than a dozen years of rationing; private imports were resumed

and all controls over prices and distribution were abolished. Shipments of vinous fruits steadily improved throughout 1953, better crops generally resulting in an easing of world prices. Dried fruit supplies had long been difficult owing to the reduced production in sterling areas, balance of payments complications, and a succession of poor harvests in Australia. The total estimated imports for 1953 at about 148,000 tons were substantially higher than the pre-war averages.

All these events of industrial interest throughout the year brought their problems which seemed important at the time, but in retrospect their substance diminishes.

People are of greater consequence than things; the loss of a man known with affection throughout the baking industry remains when daily practical troubles are forgotten. H. J. Penny of Hove died in April, a month which never failed to bring renewed hope and renewed faith to a man of courage and vision whose philosophy was an inspiration to all who knew him.

> "How often you and I
> Had tired the sun with talking
> and sent him down the sky."

Bread Consumption

In times of acute shortage, either of food or money, bread consumption *per capita* always tends to rise because bread is a good and comparatively cheap source of protein and carbohydrate.

Conversely, when money is reasonably plentiful and other foods are readily available, the consumption of bread declines.

The truth of this generalisation has again been borne out by the events of 1953. Even though national bread retains a subsidy which still exerts a significant influence on its selling price, this has not been sufficient to reverse the expected downward trend.

The re-introduction of unsubsidised white flour in August, 1953, was anticipated hopefully by some bakers, who held the opinion that white bread made with the fortified flour would perhaps increase the overall sale of bread or at least help to arrest the rate of decline, and that white bread sales might amount to 30 per cent of turnover.

These hopes were not realised and the more sober estimates of five per cent. or less have proved to be nearer the mark. This is hardly surprising, since the industry as a whole has made no attempt to tell a new generation about the virtues of a more costly, fortified, and generally an enriched, white loaf.

The enthusiastic support given to his latest offspring by Dr. Charles Hill set an example of praising the product with faint damns. Dr. Hill said the national loaf was "healthier" than white bread. It is difficult to deal with the vague uneasiness to which this kind of statement gives rise.

Public Opinion and Food

It is tempting to think of other causes of the alleged decline in public health and well-being indicated by an ever-increasing expectation of life. Irrational statements cannot be countered by reasoned argument, and an equally vague attack on some other commonplace of modern life might be one way of diverting attention. "It's the gases from the buses" which perhaps cause some people to feel not quite as fit and cheerful as they think they or their fathers used to be.

Petrol "improvers" with a considerable lead content, for example, poured into the atmosphere by more and more internal combustion engines could be the cause of nameless ills. The baking industry may very properly decline to use this kind of technique, but there would appear to be ample grounds to justify some attempt being made on a national scale to offset an unfavourable trend of public opinion towards a valuable staple food. Any such campaign initiated by bakers alone or by bakers and millers together might well prove to be worthwhile in terms of restored confidence, but it would be, unquestionably, a long, uphill, and not inexpensive struggle.

If the consumer always benefits from increasing competition as he is alleged to do, then the consumer's lot during 1953 was an increasingly happy one. Not only did competition with other foods increase but competition between contending baked products also became more evident.

Flour Confections

The ingenuity of the biscuit maker, a very alert and enterprising man, has been matched against the art of the flour confectioner. The plant confectioner, too, who can spend more on his ingredients because of his reduced production costs, has been vigorously assailing the smaller baker; his distribution costs may be lower and he has the big advantage of that appetising smell of good baking in his shop, and fewer troubles with the shelf life and fragility of his products.

The enterprise of those cake and biscuit firms who have not yet attained the dignity of elder statesmen in the industry was well exemplified by the outstanding success of the British Cake and Biscuit Association's Technologists' Conference, held in London in October. This pioneering venture, an indirect result of the Productivity Team's visit to America, was limited to one day as an experiment; seldom has a day been more completely filled with such a wide range of topics and papers followed by enthusiastic and relevant discussion. Those present were offered a choice of two papers during each session, and the biggest cause of disappointment was that no one man could be in two places at any one time. It would be difficult to single out any paper for comment, but those we attended, Gilchrist on "Uniformity of Production," Conradi on "Packaging," and Henry on "Consumer Research" were first class.

Question time in every case was all too short. Both questions and answers by men keen on their subject developed an "atmosphere" which triumphantly overcame the all-too-obvious defects of the air conditioning system.

The B.C.B.A. and those concerned with the organisation of this excellent day are to be congratulated. Meetings such as this may well lead to the formation of some future Institute of Bakery Technology which, even with the

present multiplicity of technological and scientific associations, might still find useful work to do.

Education

In the sphere of technical education, as in other higher educational fields, the post-war peak intake of students was passed, and some bakery schools could accommodate more students than applied for places. This in itself may be no bad thing if it helps to raise the standards of teaching in the more backward schools to the level of the best.

A lack of customers causes any business to examine its organisation and administration critically, and there is undoubtedly room for improvement in some academic quarters. The City and Guilds examination entries in 1953 were substantially the same as for 1952 with over 1,400 at the Intermediate stage and about 700 Final entries. These entries are drawn from over 80 teaching centres, the great majority of which offer part-time courses only.

The National Board of Bakery Education continued its attempts to ensure a greater degree of uniformity in the National Diploma examinations held at the different full-time schools. The Board's scholarship scheme, as the Secretary, Mr. C. H. R. Jarvis, has pointed out, met with problems of administration, and even principle, in an increasingly acute form during the year. Scholarships tenable in full-time bakery courses are awarded on examination results and interview and are primarily merit awards although the circumstances of all candidates are taken into account by the Board.

When bakery scholarships were first inaugurated over 30 years ago there were few Local Education Authority grants available to intending students. Nowadays financial assistance is granted by L.E.A.'s on a means test basis up to a parent's income level of about £2,000 per annum. Different authorities have different local rules, but the grant scheme is a well-established and vital part of educational administration. The question of principle which faces the N.B.B.E. is whether the private funds of the Board are to supplant or to supplement L.E.A. grants.

During the year under review, events approached an impasse in which L.E.A.'s in the main withheld their grant until the amount of an N.B.B.E. award, if any, was known. Most authorities then supplemented the Board's scholarship award if they thought fit to do so. The Board, on the other hand, in making its awards, wished to take into account the amount, if any, of the L.E.A. grant.

The Board very properly adopted the attitude that its private funds were primarily intended to supplement grants from public funds when this could usefully be done. This difficult situation has yet to be resolved; it is reasonable to suppose that it may cause the N.B.B.E. to consider *de novo* the whole basis of its existing scholarship scheme which is becoming a mechanism which, in effect, may withhold from properly qualified students the funds at the disposal of L.E.A.'s —funds especially created to help such students with their further education.

This problem, although Gilbertian, is a serious one with no obvious means of solution unless the Board contemplates taking drastic action. This it will probably be loath to do because the student may suffer when administrators fail to agree.

Recruitment and Training

Even the briefest reference to the education of food technologists would be incomplete if it omitted mention of the views on recruitment and training expressed by Prof. H. D. Kay, F.R.S., in his chairman's address to the Food Group of the Society of Chemical Industry (*Chem. and Ind.*, November 7, 1953, page 1186). Prof. Kay referred to the development of the National College of Food Technology and to the advanced courses at the Royal Technical College, Glasgow. He suggested that a four-year honours degree course in food technology might be considered at some future time provided the food industry offered sufficiently attractive openings and prospects.

Prof. Kay added: "During the war, with the obvious menace of starvation very close, the prestige of those in the food industry or food research was relatively high. Now that certain individuals, who ought to (and sometimes do) know better, continue to encourage the misconception that food scientists spend their lives pouring poisonous chemicals into the honest man's daily diet, a career in such an apparently dubious industry seems less attractive. To my mind, the Food Group should pay more attention to this prestige question. There is no industry more honorable than that which endeavours to meet the fundamental need of man for nutritious food of sound quality, and there are few professions of greater national importance, interest, and variety than that of the food scientist and technologist."

Prof. Kay's reference to a possible four-year honours degree course in food science acts as a reminder that such a course was instituted in 1922 in the Faculty of Technology of the University of Manchester. There were then few people who took the opportunity thus offered, but the honours degree course in Foodstuffs continues along with a more specialised ordinary course in Industrial Fermentations. That the numbers of undergraduates reading these subjects has remained comparatively small is perhaps due in part to the limited accommodation available, but that such is the case may be an indication either of the limited vision of the food industries or of their limited need for men of graduate status. With some Lancastrian bias it can be claimed that Manchester pioneered the enterprise and it is unfortunate that the original work has not been followed up with sufficient vigour by the industries principally concerned.

Night Baking

The Queen's Speech in Parliament in November indicated that legislation on night baking was contemplated during the coming session. Millers, brewers, potters, transport men, postmen, chemical engineers, newspapermen, yeast makers, and thousands of other people work on rotating shifts, presumably because their service

to the community requires them to do so. Why bakers should require especial legislation to govern their hours of work is not easy to understand, particularly at a time when other industries are contemplating an extension of the shift system in order to increase the productivity of their plant and equipment.

Proposed Limitation of Night Baking

The present proposals envisage the adoption of one of two alternatives, either complete shut-down between 10 p.m. and 5 a.m. (with 4 a.m. for dough makers) or the prohibition of night work for at least 26 weeks in any year for every bakery worker. It has been well said that the essentials of a satisfactory consumer service consist of bakery products delivered early in good condition at an economical price. The proposed limitation of night baking is bound to impair the present high standard of service and eventually the consumer will pay the cost, probably in terms of a more expensive and less attractive product.

The breadmaker is proud of the fact that he is primarily a fermenter, and fermentation takes time. So-called "no dough time processes" have not replaced three or four hours' fermentations because full fermentation is the basis of good breadmaking and good bread. From dough mixing to baked bread normally occupies five or six hours, followed by several hours' cooling before the bread is fit for loading; a longer period of cooling and conditioning is necessary if the bread is to be sliced and wrapped.

Bread is also a food with a limited shelf life and from this fact the present complementary production/distribution pattern has emerged. The pattern may well be destroyed by legal enactment and the service provided will suffer thereby.

So much for the case against the limitation of night baking—what about the other side of the argument? It is that it ill becomes anyone who gave up night work many years ago to criticise the efforts of those who wish to limit the night working demands on other people.

This is not the place to deal in detail with the problems arising from the proposed limitations of night baking; it is sufficient to emphasise that it is not a matter of baking alone, it involves cooling, conditioning, wrapping, slicing, loading, and delivery—a carefully timed sequence of events in a continuous production process. That is why the subject is such a complicated one. It may be either simplified or made even more difficult by the "no bulk fermentation," semi-batter, extrusion experiments reported in American journals to be now beyond the pilot scale stage. These investigations, carried out by several companies along similar lines, have aroused much interest during the year but the facts available are too limited at present for informed comment. In any event the substantial differences between British and American bread must not be forgotten. For example, it was recently reported that the sugar level in the U.S.A. has now reached an average of eight parts per 100 parts of flour used in breadmaking.

Legal Problems

During the year there has been some discussion on two subjects each of which continues to pose complicated legal as well as practical problems. Technologists in all food industries are faced with recurring difficulties caused by the occasional and almost invariably accidental appearance in foods of extraneous matter, foreign bodies, contamination, or even natural deterioration.

A considerable number of cases against food manufacturers have been brought before the Courts, and convictions have followed in a large proportion of these prosecutions when the presence of extraneous matter in a product has been established. The defence in this kind of case, as in cases concerning a deficiency in bread weight—the second of the two subjects under review—is faced with an almost insoluble problem. For example, a bakery firm making over half a million loaves every week was fined because a piece of string from a flour sack was found in a loaf.

In such a firm the proverbial "million to one chance" happens every fortnight. No one is more genuinely concerned by such an unfortunate incident than the reputable manufacturer. Not only does his pride in doing a good job suffer but his good name is tarnished and his standing is injured in a highly competitive market. When he attempts to prove that he has exercised due diligence and taken all reasonable precautions he is seldom successful. The same state of affairs usually exists in cases of bread weight deficiency.

Due Diligence

What is "due diligence"; what are "all reasonable precautions," and what is "a *bona fide* accident"? What are "causes beyond the manufacturer's control" and what is meant by the word "unavoidable"? Judging by the results of most prosecutions, "due diligence" is that sort of diligence which will prevent any kind of mishap at any and every hour of the day and night. In that event the need for prosecution and hence the need for a defence, will never arise and the clauses alleged to act as "safeguards to traders" become virtually meaningless. Each of the other phrases can be construed in the same way—a "*bona fide* accident" is one that never happens and "all reasonable precautions" are such as will completely prevent any defect.

Reasoned argument in Court is stultified by the many adverse decisions given, and the feeling is increased that "justice is what you get when you win"—an unsatisfactory state of affairs. Those who have taken part in discussions on these subjects appear to be divided into three categories: (*a*) the food technologist whose job it is to help to reduce to a minimum the risks inherent in all food manufacturing operations, (*b*) representatives of the inspectorate taking on the whole a balanced, reasonable, and constructive view of the manufacturer's difficulties, and (*c*) the militant analytical character whose virtuous indignation is entirely owing to his public spirited desire to protect the public from the accidents, never "*bona fide*," which ought not to happen to food products.

No one will argue that carelessness and faulty supervision do not exist in food factories, nor will they argue that a breakdown in plant and equipment never occurs. No one disputes the fact that the inspectorate, whether public health or weights and measures, has a duty to perform, but it is equally true that *in Court* the scales are heavily weighted against the defence in cases of alleged negligence for the reasons given in this brief survey.

Some attention has been given during the year to optimum dough divider setting and an arithmetical treatment designed to reduce the amount of bread wasted by reason of its deficiency in weight was described. The writer of a communication on the subject was evidently not discussing the legal aspect of the matter because he disregarded the fact that the legal existence of a loaf deficient in weight is a function of distribution. The Court shall disregard any inconsiderable variation in the weight of a single article and shall have regard to the average weight of a reasonable number of such articles. If, therefore, a loaf is deficient in weight by half an ounce, if half an ounce is accepted as an inconsiderable variation and if the nominal lightweight is weighed in a group of 12 loaves, 11 of which weigh half an ounce each in excess of the required weight, and if again, a group of 12 is regarded as a reasonable number, then the nominal lightweight has no legal existence. This argument does not apply to single loaves grossly deficient in weight.

Literature for the Bakery Technologist

The advent of the *Journal of Agricultural and Food Chemistry* published by the American Chemical Society was an outstanding feature of 1953. This illustrated and glossy affair is presented in the modern manner which, until the reader gets used to it, tends to conceal its real worth and substance. Perhaps this view is ultra-conservative and unkind, but a spray of oats, an ear of barley, and a diminutive maize cob sprouting out of the middle of a perspective graph (showing the declining *per capita* consumption of total grain products and wheat flour in U.S. 1909-52) must surely tend to distract the attention of the scientifically inclined reader rather than to focus it.

The British *J.S.F.A.* is a very different cup of tea, if that is not too light a phrase to be even remotely connected with such a solid, traditional, and uncompromising text. That the newcomer has had more of interest to the bakery technologist in its few months of existence than its home-produced counterpart in its few years is probably true and not without significance. Perhaps it is not possible properly to compare the merits of two such widely differing periodicals, even though their names would appear to indicate that each attempts to fulfil a similar need; they are, in a way, complementary.

One of the most interesting papers published during the year was that of Baker, Parker, and Fortmann (*Cereal Chem.*, **30**, 1, 22) on the "Flavour of Bread." Anyone who has observed the steam distillation from a travelling bakery oven and thought that a number of valuable volatiles were perhaps being needlessly wasted, cannot fail to be impressed by this study. The important part played by sugar is emphasised as it affects the taste and smell of American bread, not only by sweetening but by its influence on the products of fermentation and crust browning.

A valuable contribution to the literature on bromate effects was made by Hlynka, Templin, and Anderson (*ibid.*, **30**, 5, 391). Their work indicates that the generally accepted views of the improver action of bromate may need revision. The next paper in the journal by Hites *et al* (*ibid.*, **30**, 5, 404) may well be considered along with that of Hlynka and his co-workers. Hites states that his results show that the enzymes of flour have practically no action on its protein and that they cannot properly be classified as papainases.

Both these papers point the way to what may prove to be an important step forward in the understanding of the physical and chemical characteristics of wheaten doughs. Some observations of Horris and Walster (*ibid.*, **30**, 1, 58) on a 64-year-old wheat sample are reminiscent of the pioneer work of Bradley and Whymper (*ibid.*, **24**, 3, 228) in this field.

Journals come and abstracting services go or they are to be redesigned, or they will revert to a previous system. The British Bureau of Abstracts ceased to function at the end of the year and what used to be the food abstracts classified as BIII, will be published in 1954 in the *J.S.F.A.* while Analytical Abstracts will be bound separately from the *Analyst*. All those whose habit it was to build up a useful classification from the "printed one side only" abstracts will be deprived of their scissors and paste activities unless they wish to buy three copies of the journals concerned.

The series of monographs on the rheological behaviour of natural and synthetic products was extended by the addition of a volume on "Foodstuffs—Their Plasticity, Fluidity and Consistency" under the editorship of Dr. G. W. Scott Blair, of Reading. This book, which it is a pleasure to handle as well as to read, collects together rheological information from diverse fields and for that reason it is both useful and stimulating. Incidentally, the ingenious mechanical contrivances mentioned, and often illustrated, do not include that of Klokgieters of Delft, whose elegant use of the rolling ball in his apparatus for measuring rusk crispness and bread compression gives a delicate and controlled increase in the application of stress to the sample.

A paper by Morries and Stuckey (*Anal.*, **78**, 932, 636) on the chromatographic determination of glutamic acid in wheat gluten and gluten hydrolysates describes their method whereby a suitable ion exchange resin is employed for the separation of the dicarboxylic amino acids.

Work of this kind causes those with limited laboratory accommodation usually fully occupied by production control work to wish they could do more in such an interesting by-way of their technology.

Management Problems

In these annual surveys, reference has occasionally been made to management problems; this necessarily superficial glance at a number of happenings during 1953 and the comments of one man on some of them may well end on a management note. The National Institute of Industrial Psychology published a report called "Two Studies in Supervision" by Livingstone and Handyside. They form part of the research initiated some years ago by the Human Factors Panel of the Committee on Industrial Productivity, the funds being provided by the Medical Research Council. The point was emphasised that the foreman is concerned about the opinions of higher levels of management about his competence because his knowledge often applies specifically to the procedures of his own firm and thus may not be a commercially valuable commodity if he loses his job.

In the study of supervision in a cotton mill the good foreman was described as fair, firm, and approachable, genuinely interested in his own job and in the welfare of others. He was not afraid to admit ignorance of a skill when the workman concerned was more expert than he was.

It has been said that "if you want to cause a miracle in British industry, try doubling the wages of your foremen," but the problem of middle management cannot be solved as easily as that. If the remark was intended to imply that by so doing a new and better breed of foremen might be developed in a generation or two, then it indeed provides food for thought.

The foreman often reaches his position by long, reliable, and willing service rather than by outstanding intellectual or physical agility, and the ability of such a man is not rapidly nor easily improved either by a substantial wage increase or any other form of stimulus. Like everyone else, the foreman often has defects usually closely related to and even caused by his virtues. The more enterprising man may move on, rather than wait his turn for promotion to foreman, while the more stolid, reliable man remains.

A production manager sometimes works on the fairly sound principle that he would rather have a second rate man who is always there on the job, steady, punctual, willing to do his best, rather than a more quick-witted individual always wanting to introduce new fangled notions. That sort of production manager may be wrong but he is responsible for turning out the work regularly, day in, day out, and his views cannot be ignored; they affect his choice of foremen and that sort of foreman usually stays with a firm until he collects his pension.

Food Must be Made Safe

A USEFUL addition to the literature concerned with the campaign for a safe food supply is Dr. Betty Hobbs's concise and authoritative monograph.* All those concerned with catering, and especially large scale catering, will find in it a clear and accurate account in simple language of the various causes of bacterial food poisoning, the means by which the infection is spread, and of its prevention.

The aim of food hygiene should be the production and service of food which is not only clean, but which is also free from pathogenic organisms. The problem so presented demands attention to three main factors: the personal hygiene of those responsible for handling food during production and service; the conditions under which food is stored; and the general design of kitchens and their equipment.

The monograph is divided into two parts. Part I deals with elementary bacteriology and is enhanced by some excellent illustrations. Subsequent chapters are devoted to the bacterial causes of food poisoning; human and animal reservoirs of infection, the means by which it is spread, and the vehicle of infection.

Examples are given of typical food poisoning outbreaks with simple explanatory diagrams, while a whole chapter is devoted to food-borne infection.

Part II commences with a short introduction on food hygiene in the prevention of food poisoning, followed by chapters on personal hygiene of the food handler, food storage and preparation, and utensil cleaning and sterilisation.

Mr. L. Kluth, Sanitary Inspector to the Borough of Wembley, has contributed two very useful chapters, illustrated by drawings and photographs, on kitchen design and equipment, and the control of vermin and insects.

A chapter showing how food traders can assist in reducing the number of cases of food poisoning is included, followed by one giving extracts of the relevant present and future legislation affecting food and food-borne infections.

A final chapter discusses education, giving suggestions and aids to the teaching of food hygiene in schools, to kitchen staff, traders, and the general public. Attention is also directed to the efforts which are being made by trade associations, federations, and clean food guilds to include this important subject in the instruction given to young persons entering any branch of the food trade or industry.

The author and publishers are to be congratulated upon the production of this monograph, which is well printed, illustrated, and indexed. The information and guidance contained in it should be valuable to all those interested in the manufacture, transport, handling, and preparation of food and food products, as well as the catering trade in general.—E. B. D.

* *Food Poisoning and Food Hygiene.* By Betty C. Hobbs, B.Sc., Ph.D., Dip. Bact. Pp. 174+ix. Arnold. Price 14s.

Correspondence

To the Editor,

FOOD MANUFACTURE

DEAR SIR,—In connexion with the comment on bread additives in the November issue of FOOD MANUFACTURE, we should like to point out that the U.S. Standards provide for the optional use of lecithin (as well as monoglycerides). Obviously, the controversy over "chemicals in foods" has had no bearing on the status of vegetable phosphatides.

Very truly yours,

AMERICAN LECITHIN COMPANY, INC.

New York.

New laboratory and headquarters building for Midwest Research Institute.

How an American Research Organisation Operates

Desmond Reilly, Ph.D., F.R.I.C.

AMONG the scientific institutions in the United States are many, privately run, which aid manufacturers and others with their research and technical problems. Such groups are independent of Government departments, trade associations, and university colleges. The Midwest Research Institute, although only 10 years old, already occupies a leading place among such organisations, and is representative of those playing a vital part in American science today.

The author, a graduate in chemistry of University College, Cork, has taught in American universities and worked in the Canadian chemical industry, and for the past two years has been an Associate Chemist at Midwest Research Institute at Kansas City, Missouri. In this article he describes the nature of the work performed, the staff engaged upon it, and the facilities available for carrying it out.

How it Began

Midwest was originally started to serve the six-state area of Missouri, Kansas, Arkansas, Oklahoma, Iowa, and Nebraska. It now covers a much wider field. Industry in the six-state area expanded considerably during and after the second world war. Kansas City, as the geographical centre of the zone, seemed the logical place for an institution that would provide scientific and technical help to the new industries.

A group of industrial and professional leaders in the area organised the Institute. Contributions to this non-profit enterprise from 400 different donors provided the initial operating funds and working capital totalling one and a quarter million dollars. The only return which the donors could expect from the money was the general improvement in technical help and advice provided by its operations. Although the funds are small compared with the large endowments of certain other similar U.S. institutes, this modest start has provided the firm foundation on which Midwest has since built a nation-wide reputation, and has become entirely self-supporting.

How it is Organised

At the top of the Institute chain of command is the Board of Governors, many members of which were among the original planners. The chairman of the Board is Kenneth A. Spencer, President of the Spencer Chemical Company. The other 20 Board members are Presidents of companies from the six-state area in the fields of dairy products, paints, salt, lumber, steel, coal, domestic appliances, corn products, glass, various chemical specialities, as well as Presidents of a railroad, a pipeline company, and an electric power comany. Another member is managing editor of the leading newspaper in the area, the *Kansas City Star*.

The actual running of the Institute is in the hands of the Presi-

Through its food research department, the Institute is able to work on the development of special pre-mixes, the utilisation of by-products, new specialty foods, and studies in nutrition.

dent, Dr. Charles N. Kimball, Doctor of Science of Harvard, who had an enviable record of achievement as a practising engineer and as a director of scientific programmes and personnel before coming to Midwest.

Directly responsible to Dr. Kimball for all scientific operations are two Associate Directors. For chemistry is Dr. M. H. Thornton, an authority in agricultural chemistry with a wide experience in original research on fats and oils while on the staff of Purdue University for almost a quarter-century. His opposite number in engineering is Mr. Martin Goland, a nationally known authority in applied mechanics, an M.E. of Cornell University, and editor of *Applied Mechanics Reviews*, which is prepared at Midwest.

The chemistry half of Midwest is further broken down to divisions of chemistry and chemical engineering, each of which is under the control of a manager. Similarly, engineering comprises divisions of physics, mechanical engineering, electronics, and instrumentation.

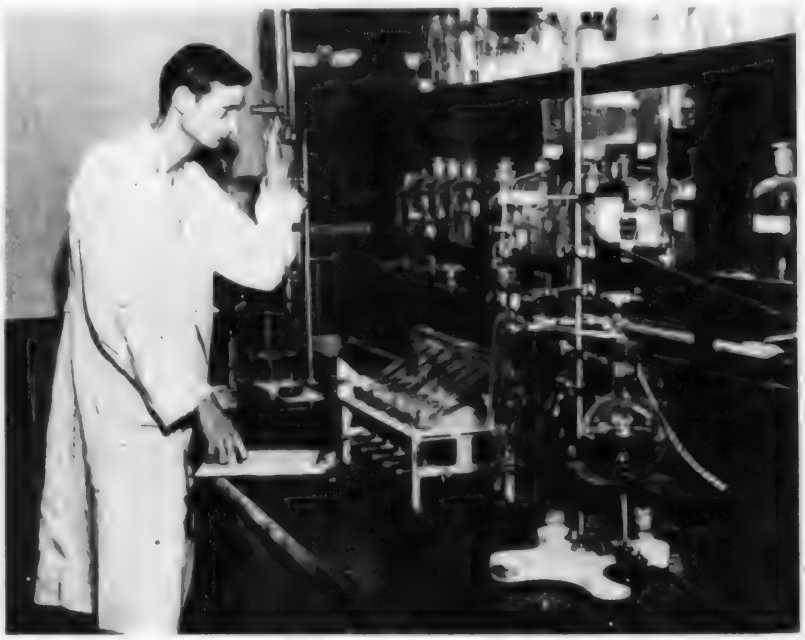
Specialists in 20 Different Fields

One hundred and eighty-eight people work for the Institute; of these, 135 actively follow professional careers in 20 different fields of science. The Institute carries out sponsored research programmes ranging from broad studies requiring the combined efforts of all divisions, to specific projects involving the specialised training and experience of individual staff members.

In chemistry, for example, specific projects are assigned to an Associate Chemist, who is usually a Ph.D., and who reports to the Division Manager. There are also a number of assistant chemists who help on such projects under the direction of the Associate Chemist. The term "chemist" as used at Midwest is a general one, and does not necessarily mean that the man is trained in any particular branch of chemistry. He may be a nutritionist, a plant pathologist, a biochemist, a soil scientist, or a zoologist.

In the food research laboratory, programmes have been completed in the development of pre-mixes, by-product utilisation, novel foods, and in a variety of animal nutrition studies. The fats and oils laboratory has carried out successful work on the utilisation of non-edible waste fats, in the appraisal of antioxidants, in rancidity studies, and in the investigation of soya bean oil reversion. The fermentation laboratories have developed methods for increased yields of riboflavin and improved submerged culture techniques.

The Institute now occupies six separate buildings, with 50,000 sq. ft. of floor space, of which nine-tenths is devoted to laboratories, workshops, and pilot plants. Experimental field stations are also operated for tests in agriculture, mechanical engineering, and electronics. But space having become a problem, it was decided that a new building, in which all the divisions could operate under one roof, was necessary. Again local and national business



The Institute's chemists have aided in the development of analytical techniques for smoke residue and process control improvements.

and industry was asked to help. The money was forthcoming, and now a new ultra-modern building is being erected, which will form a scientific research centre. This new building is to be built in the area south of Kansas City known as the city's cultural centre, an area where the University, Art Gallery, and other civic buildings are located.

Exploitation and full utilisation of natural resources by industry is another objective of the Institute.

Who Pays for the Research?

Those who make use of the Institute range from local business men to national companies. For the sponsor with little in the line of technical facilities, Midwest frequently carries projects from the original idea through product or process design to final application. It is from work of this kind that the local supporter benefits most in expanding his field of operations in a very competitive economy.

Larger companies, with their own extensive research and development laboratories, also come to Midwest, especially in times of peak research loads, or in the undertaking of supplementary or parallel investigations in close collaboration with their own staffs.

A considerable amount of work is also done either directly or indirectly for various Government or service departments in connexion with the present defence effort.

The Men Who Work at Midwest

Where widely varying problems of research and development have to be dealt with, a staff with broad capabilities, in education and in practical experience, is required. Good men interested in applied research are attracted to Midwest for various reasons, the chief among these being that the organisation and the working conditions approximate in many ways to those of academic or college life.

Journals and abstracts circulate among the staff, attendance at scientific meetings is encouraged, private part-time research is possible, and there is a free interchange of ideas between workers in different fields. Yet the work has practical applications, and the salaries paid are on the industrial rather than the academic level. The staff is able to meet a variety of industrial sponsors, and keeps in touch with current trends in many fields of industry.

Technical men at Midwest are graduates of practically every first-class University in the United States, as well as of various non-American schools. The names of the companies and organisations in which they worked before coming to the Institute provide a long and impressive roster of the leading American companies and research organisations.

How an Investigation Proceeds

Whether an Institute is satisfying its sponsors is shown by the amount of repeat business. Among sponsors whose original projects have amounted to $5,000 or more at Midwest, more than 75 per cent. have since placed additional business.

When an enquiry is received from a potential sponsor, the problem is reviewed and studied by the specialists on the staff, without any cost to the originator of the enquiry. It is an inflexible rule that no project will be undertaken if it conflicts with or is in any way parallel to an existing project. If it is felt that the problem indicates promise of a workable solution in a reasonable time, a written proposal of a suggested approach is prepared, such proposal outlining the technical and scientific background, the suggested plan of investigation, and the estimated cost.

If the sponsor agrees, a written contract is then signed, setting maximum limits to the cost of the work and the time needed to complete it. The cost figures are computed by adding together the staff salaries of those who will work on the project, the cost of chemicals, special equipment, and shop work, plus a nominal surcharge to cover such overheads as management, use of laboratory facilities, typing of reports, and the like. If the investigation costs are less than the estimate, the sponsor pays only the actual ones.

Any small amounts that may be realised in the course of the working operations are ploughed back into the Institute, and used for such purposes as the paying of the salaries of staff members while working on private research or special Institute-sponsored projects of a fundamental nature.

As work on a project proceeds, progress reports are made to the sponsor. Regular staff meetings are also held, when the progress of the investigation is reviewed, and modifications in the line of research are suggested. If for any reason the sponsor wishes to cancel the contract, he can do so at

Work on the tempering of wheat to obtain a higher percentage of white flour while lowering milling cost is conducted.

any time. Inventions and patents arising out of the work become the property of the sponsor, and patent experts on the Institute staff can often give him considerable help in the skilful drafting of patent claims.

Market and Resources Surveys

An area like America's Middlewest, which still has considerable room for scientific expansion, needs many surveys in the fields of markets, resources, and engineering facilities of specific areas. Midwest has already done excellent work in this field, and much more is being planned for the future. A typical survey might consist of a detailed study of the present and future uses of a specific agricultural or food product, a determination of the availability of raw materials, the selection of the best manufacturing or processing plan, as well as the preparation of estimates of capital requirements and production costs.

To carry out such surveys, extensive library services are needed. Midwest has an excellent technical library, which houses many of the leading British as well as American technical and trade journals and abstracts. In addition, adequate photostatic and reproducing facilities are available.

Although the Midwest Research Institute is a young organisation, it has already justified the faith of those who invested money in it initially. Midwest and other regional research centres opened since the second world war in various parts of the United States are playing a big part in American scientific and industrial development. Apart from aiding existing industries, such organisations are bringing many new chemical and other industries into their areas. In selling science to local manufacturers, they are playing a significant part in the advancement of American pure and applied science.

Food Through the Ages

NUTRITION and Environment in Food Gathering and Food Producing Times is the sub-title of a book* intended as a historical survey of food habits down to the close of the classical period.

Its 20 pages of references are evidence of the author's pertinacity; Dr. Jensen is clearly a most painstaking snapper up of otherwise unconsidered trifles, but the fact that he has not quite succeeded in fusing them into a balanced and really convincing whole is probably not his fault. It would have been a task for a man whose scientific judgment had grown more mature.

Since the Drummonds published their "Englishman's Food" shortly before the war, it has been obvious that food offers a most interesting subject for historical research. Yet, though the time was ripe, they have had few imitators; such further works as have been published are rather in the nature of brief essays. Sir Jack Drummond made no claim to be a historian, and here in a sense lies the merit of his book. In the main he allows his sources to speak for themselves, and assumes that his readers will assimilate what his sources have to tell them into any historical background they may happen themselves to possess. But Drummond was a good food chemist; he knew and had considered most of what was to be known in his day about the science of nutrition. In other words, he built his narrative into a thoroughly reliable scientific framework.

I do not feel quite as comfortable with Dr. Jensen. He is, I believe, a competent research worker; but that does not necessarily make him capable of assessing the value of his evidence in so complicated a subject as archaeology. Moreover, the views he expresses about the influence of nutrition on the hereditary factors in man are at least very dubious. Like many books of its kind, "Man's Food" becomes at times rather a curious collection of intriguing suggestions and quotations than a guide to scientific enquiry.

I do not want to seem ungracious to the author—he often held my interest, even if it was at times a critical and irritated interest. Most research workers who browse through the book will, after all, absorb from it a general impression of the kinds of food our ancestors were probably eating, and the vague impression they gain and store in memory (most stored impressions are fairly vague) is likely to be a passable picture of the remote past, as good a picture as anyone has so far attempted to draw.—F. LE G. C.

* *Man's Foods*. By Lloyd B. Jensen, Ph.D. Pp. 278+x. Garrard Press. Price $4.50.

Brown Bread and White Bread

R. W. Moncrieff, B.Sc., F.R.I.C.

Interest in the relative merits of brown and white breads centres mainly on their aesthetic appeal, the relative nutritive values of the two breads, and their relative bulking values. Knowledge which has come from research that has been carried out in the last few years has thrown new light on the two latter points and can be discussed factually.

MANY people while thinking of bread as a valuable source of carbohydrate, do not regard it as a particularly valuable source of protein.

It so happens that when wheat is milled into white flour with 70 per cent. extraction, those portions of the grain which are lost to the flour include those that are richest in protein. The lost fractions comprise the fibrous pericarp, the aleurone layer, the germ, and the outer portions of the endosperm. Of these, the aleurone layer has a protein content of 22 per cent. and accounts for about one-sixth of all the protein in the wheat.[1] The germ is even richer, but as its weight is only about 2 per cent. of that of the whole grain, the contribution that it makes to the total protein is not very great.

The outer layers of the endosperm have a higher protein content than its inner layers, with the result that the total protein content of a 70 per cent. extraction white flour is considerably lower than that of a wholemeal (100 per cent. extraction) brown flour. Furthermore, the protein content of various flours varies greatly, *i.e.* from one kind of wheat to another; a hard Canadian wheat will have a higher protein content than a soft English wheat.

One other factor—an important one—is that there is reason to think that the quality of the protein in 100 per cent. flour may be superior to that in 70 per cent. flour.

Relative Quality of Protein

A methodical investigation of the relative quality of protein in brown and white flours was conducted by Chick and Slack[2] of the Lister Institute of Preventive Medicine, who set out to investigate the nutritive values of the proteins contained in wheat flours of different extraction rates. The higher the extraction rate of a flour, the more of the bran and the germ are left in the flour; as these are the parts of the grain that have the highest protein content, it follows that the higher the extraction rate the higher is the protein content. Thus the nitrogen contents of the flours that Chick and Slack used varied with the extraction rate as shown in Table 1.

All the flours referred to in Table 1 had been milled from the same grist. They were incorporated as the sole source of nitrogen (and therefore of protein) in a series of four diets which were adequate in other constituents; the protein content was low at about 12 per cent., but was the same in all four diets.

The diets were made from the four flours of different protein contents in such a way as to have the same total protein content and the same carbohydrate content, by diluting the high protein (high extraction) flours with a little maize starch, which is almost free from nitrogen content (only 0·03 per cent.). The four diets were given to four groups of six rats each, comparable in heredity, sex, and initial body-weight. The rats were maintained on this diet for seven weeks and were weighed weekly. Those rats that were fed on the flours with the highest extraction rates gained weight most rapidly, as shown in Table 2.

These experiments, which were confirmed by others, showed that the nutritive efficiency for the support of growth in rats is about 20 per cent. greater for the proteins of whole wheat flour than for those of white flour of 70 per cent. extraction.

Of the flours of intermediate extraction, that of 85 per cent. extraction, the rate which was selected in 1942 as National wartime flour for ordinary bread-making, was nearly as valuable as the wholemeal. The flour of 80 per cent. extraction rate compared badly with the wholemeal and with the 85 per cent. extraction flour. The nutritive advantage of the 85 per cent. extraction over the 80 per cent. extraction was due to the greater proportions of the aleurone and of the germ which it contained.

It should perhaps be reiterated that in the feeding tests outlined above, the four diets were adjusted to contain the same *quantities* of protein, and that the differences in growth rate were attributable entirely to differences in *quality* of the protein. If, therefore, equal *weights* of wholemeal and of 70 per cent. extraction flours were to be taken, the differences in growth would be expected

TABLE 1

Extraction rate per cent.	*Nitrogen content per cent.*	*Protein content* (5·83×*N*) *per cent.*
70	2·34	13·6
80	2·42	14·0
85	2·52	14·4
100	2·55	14·5

TABLE 2

Extraction rate of flour—the main item in the diet.	*Grams gained per rat per week in weight.*	*Grams weight increase ÷ Grams protein consumed.*	*Percentage of the ingested nitrogen which became incorporated in the bodies of the rats.*
70	6·6	1·35	22·0
80	7·6	1·47	22·1
85	9·2	1·63	24·6
100	11·3	1·63	26·7

to be even greater than those indicated in Table 2.

Rate of Passage through the Body

A recent investigation has been made by McCance, Prior, and Widdowson,[3] in the Medical Research Council Department of Experimental Medicine at Cambridge, of the rate of passage of brown and white breads through the human digestive tract. It has long been known that brown bread has a laxative effect and gives bulkier faeces than white; it has been known, too, that it passes through the body more quickly than white. No information, however, has been available as to where the speed-up takes place; whether, for example, a meal of brown bread leaves the stomach more quickly than one of white, or whether the brown bread passes more quickly through the small gut, or through the large intestine.

There is considerable evidence showing that the absorption of some of the nutritional components from brown bread is low, and if it were found that brown bread passed more rapidly than white through one portion of the gut, it might be possible to find the reason for the poorer absorption. It seemed odd that no definite knowledge was available on the locality of the speed-up, and it was broadly to provide such knowledge that McCance *et al.* undertook their research.

Tests with White Bread

Two breads were used, one was brown, a wholemeal of 100 per cent., and the other was white, of 70 per cent. extraction. Six subjects, three men and three women, took part in the tests, living for some days on a diet which consisted mainly (75 per cent.) of white bread, the other 25 per cent. consisting of egg, cheese, bacon, meat, butter, bramble jelly, and golden syrup. After having lived on this diet for two days, they then had a meal in which their white bread was spread with a little barium sulphate. The passage of this meal through the digestive tract was then watched by X-ray screen or radiographs at frequent intervals on the first day, and at less frequent intervals on the succeeding days, until all the barium sulphate (accompanied by the residue of the meal) had passed through the body.

Tests with Brown Bread

The subjects were then given a break of a week or longer, and the experiment was repeated using brown instead of white bread. In actual fact, four of the subjects had brown bread during their first period and white during the second, while the other two started on white bread and finished with brown. It was found that the subjects preferred the diet of white bread to that of brown, but rather significantly as the days progressed, "they got to like the brown bread more and the white bread less."

One of the first observations that was made was that on the radiographs the shadow of the stomach appeared larger after the brown bread meal than it did after the white. Furthermore, when later the meal had reached the colon, "the residue from the brown bread was more homogeneous, and the colon was wider when it contained the residue from the brown bread than when it contained the residue from the white bread." The greater size of the stomach shadow suggests that the brown meal induced a larger amount of secretion; this secretion is probably salivary because it takes considerably longer to eat a meal of brown than one of white bread. In the gut itself, it is the "filling" effect of the hydrated celluloses and the hemi-celluloses present in the bran of the brown bread, but not in the white bread, that causes the increased diameter of gut—in other words, the bulking effect of the brown bread residue is due to its more hydrophilic characteristics.

Actual timings of the transit of the bread through the system are shown in Table 3, in each case the figures being the average for six people.

The findings from this research are, therefore:

1. The brown bread stimulated a greater secretion of saliva, and possibly of gastric juice, than did the white bread.
2. The brown bread was evacuated from the stomach and passed through the small intestine more rapidly than the white.
3. The residue from the brown bread was bulkier than from the white.
4. The residue from the brown bread left the colon a day earlier than that from the white bread.

The greater bulk of the residue from the brown bread and its more hydrophilic nature are thought to account for the more rapid transit and expulsion of the brown bread residues.

Although it required two days for the meal of brown bread to be completely evacuated, excretion of this meal (which had been tinted with carmine) started in the case of two of the subjects within 9 to 10 hours of eating the meal, and in most of the others on the following morning. It took considerably longer for carmine taken with the meal of white bread to make its first appearance in the faeces.

Digestibility of Wholemeal Bread

The new information which has been made available concerning transit times of meals of brown and of white bread through the human digestive tract, and which has shown the progression of the meal through the system at all stages, lends new interest to the subject of the digestibility of brown bread. Does the faster passage mean that there is insufficient time for the body to digest the bread properly and to absorb as fully as it may the nutritional elements?

Valuable information on this subject is to be found in an earlier paper by McCance and Walsham,[4] who investigated the digestibility and absorption of the carbohydrates, proteins, purines, fat, and calcium in two kinds of wholemeal (100 per cent. extraction) wheaten bread. One was made

TABLE 3

	Brown	*White*
Time taken to eat the meal of about 10½ oz. bread ..	45 min.	34 mins.
Time taken for the stomach to empty	4·2 hours.	5·3 hours.
Time taken to pass through small intestine (until head of meal reaches caecum)	4·4 hours.	5·9 hours.
Time for total excretion of meal, *i.e.* all barium sulphate evacuated	2 days (one subject 3 days).	3 days (one subject 4 days).

TABLE 4

	Wholemeal Bread from	
	Canadian wheat per cent.	*English wheat per cent.*
Protein	15·40	8·52
Purine nitrogen	0·025	0·012
Fibre	2·36	2·02
Fat	2·23	1·83
Available carbohydrate	55·20	63·60
Pentosans, etc. (undetermined matter)	9·78	9·02

TABLE 5

	Wholemeal Bread from	
	Canadian High Protein Wheat.	*English Low Protein Wheat.*
Bread consumed (dry weight) in 7 days	9·8 lb.	9·8 lb.
Calories in food (94 per cent. from bread, 6 per cent. from syrup, marmalade, etc.)	20,680	19,525 (English wheat has a slightly lower energy value)
Calories found in faeces	2,500	2,165
Digestibility (per cent.) of total calorie intake	88·0	89·0

from a high protein Canadian wheat and the other from a low protein English wheat. The chemical compositions of the experimental meals on a 15 per cent. moisture basis are shown in Table 4.

Six subjects, three men and three women, took part in the experiment; they lived almost entirely on one of the breads for about 11 days, then returned to their normal diet for three days and then had another 11 days on the other kind of bread. Some of them took Canadian wheat bread first and English second, others took the English in their first period and the Canadian in their second.

Each subject had as much bread as he or she desired in the first period, and the same weight of the other kind in the second period. For the first three days no records were kept, then for seven days all urine passed was collected; carmine was taken before the first meal and faeces saved from the time this appeared until carmine taken with the first meal after the expiry of the seven day period again appeared. The urine and the faeces were analysed. Results that emerged from the experiment were tabulated.

Energy Absorption

The calorific values of the breads, flours, and faeces were determined by the bomb calorimeter. One of the group of subjects ate only bread, the other five had small quantities of golden syrup, bramble, and marmalade jelly, and the calorific values of these were taken into account. The results obtained were as in Table 5.

The difference in energy absorption was small but was statistically significant, and was in favour of the English wheat. This may have been because the fibre content of the Canadian wheat was rather greater (2·8 per cent.) than that of the English wheat (2·4 per cent.); rather less than one quarter of the fibre in bread is digested, the rest of it passes through in the faeces.

Protein and Nitrogen Balance

The Canadian wheat provided nearly twice as much protein as the English wheat; it is, therefore, of particular interest to see how much of the protein that was offered to it the body was able to utilise. It is noteworthy that wheat, which is ordinarily looked on solely as a source of carbohydrate, should in the case of the Canadian variety have provided about 4 oz. protein daily to each subject. Analytical results are shown in Table 6.

The inferences that can be drawn from these figures are as follows:

1. On average, the subjects are in positive nitrogen balance when eating the Canadian wheat, but in negative nitrogen balance when eating the English wheat. It may be that if sufficient time had been allowed for the subjects to have come into nitrogen equilibrium, it would have been found that the subjects were getting a sufficient amount of all the necessary amino acids from the proteins in the English wheat as well to satisfy their requirements.

2. Despite the big difference in the nitrogen intakes when consuming the two breads, the nitrogen found in the faeces from the two breads were almost equal. This is taken to indicate that the protein in each of the wheatmeals was completely digested and absorbed, and that the nitrogen found in the faeces was derived entirely from intestinal juices. The high fibre content of wholemeal bread is known to cause a greater secretion of these juices and accordingly a higher nitrogen content in the faeces. If this interpretation of the results is correct, then the "apparent digestibility of nitrogen" has little theoretical meaning.

Purines and Fat

The Canadian wheat contained more purines than the English wheat; 55 to 60 per cent. of them appeared to be absorbed and to be excreted in the urine as uric acid.

The bread made from the Canadian wheat contained 2·62 per

TABLE 6

	Wholemeal Bread from	
	Canadian wheat gram.	*English wheat gram.*
Protein intake per person in 7 days	798	424
Nitrogen intake in 7 days (*i.e.* nitrogen in the protein)	135·8	72·8
Nitrogen output in 7 days in urine	108·2	57·0
Nitrogen output in 7 days in faeces	20·8	19·5
Nitrogen output in 7 days in urine and faeces	129·0	77·4
Nitrogen balance per person	+6·8	−4·5
	Per cent.	*Per cent.*
Apparent digestibility of nitrogen (and thereby of protein)	84·9	74·2

TABLE 7

	Wholemeal Bread from	
	Canadian wheat	*English wheat*
Intake (per person) of fat in food for 7 days (gram)	116·8	95·8
Fat in faeces (gram)	49·5	44·0
Digestibility of fat (per cent.)	62·2	53·9

cent. of fat while that made from the English wheat contained 2·15 per cent. Fat was estimated in the faeces of the subject and the digestibility of fat in the wheat was estimated on the assumption that digestive secretions themselves do not contain fat. Results obtained are shown in Table 7.

It is evident that wheat fat in wholemeal bread is digested much less efficiently than wheat proteins. The "found" figures of 62·2 and 53·9 per cent. represent a much lower degree of absorption than had formerly been thought to obtain for the fat in wheat.

Calcium

As late as 1940 it was thought that wholemeal bread offered a much higher intake of minerals, and of calcium in particular, than did white bread. It was soon found, however, that the phytic acid, which was present in a much higher content in wholemeal bread, combined with the calcium to form an insoluble salt, so that the available calcium in wholemeal bread is less than that in white bread. It was for this reason that calcium carbonate was added to National war-time bread. The wholemeal flours that McCance and Walsham investigated did not contain any such additives. The calcium taken in from the bread and from the water drunk by the subjects and the calcium excreted by them in urine and faeces were measured with the results as shown in Table 8.

All the calcium balances were negative, largely because of the fixation of the calcium of the digestive juices in the intestine by the phytic acid in the bread. This shortage of calcium induced a severe attack of tetany in one of the subjects at the close of the experiments. He experienced severe cramps in his fingers and toes, and had difficulty in controlling his spoon and fork.

The outstanding result from all this work is that the body makes good use of the protein in wholemeal bread, and that it deals only indifferently well with the fat. The high protein intake that can result from a diet of wholemeal bread is of considerable interest. It recalls the story that Wellington's soldiers lived mainly on the pouch of *wheat* (not bread) that they carried.

The author can testify from personal experience that it is much more interesting and satisfying to eat a handful of wheat grain than it is a chunk of bread, whether white or wholemeal. The negative calcium balance that was revealed in the work described above is probably of little consequence when a mixed diet, containing other sources of calcium, is taken. As already noted, there was sufficient calcium carbonate added to the National 85 per cent. extraction flour to correct this deficiency.

In making comparisons between white and wholemeal bread, it is always difficult to forget the widespread incidence of canine hysteria which Mellanby demonstrated was caused by a factor toxic to dogs in Agenised white bread, and to associate it with the state of hypertension in which so many of us seem to live nowadays. This despite the fact that recent work has led to the isolation of the factor toxic to dogs and has shown that its effect on humans is in no wise the same.

It may be true, as a recent editorial of the *British Medical Journal*[5] suggests, that "for persons whose economic circumstances permit them to eat a good mixed diet, it probably matters little whether they eat white or brown bread, but for those whose staple food is bread, the colour is important." However satisfactory are economic circumstances, it seems to be a pity to eat bread made from flour in the processing of which "a third of the protein, two-thirds of the essential amino acids and riboflavin, practically all the vitamin A, and 80 per cent. of the iron, nicotinic acid, and aneurin are removed, as well as other members of the vitamin B complex."

To those who can afford not to eat bread, and have no intention of eating more than a morsel of it, it does not matter a great deal what there is (or is not) in it. But for those who like bread, recent research has given a good deal of food for thought, and perhaps for re-assessment of aesthetic appeal.

TABLE 8

	Wholemeal Bread from	
	Canadian wheat Mg.	*English wheat* Mg.
Average daily intake per person of calcium from bread	363	257
Average daily intake per person of calcium from water (the three subjects eating Canadian wheat drank more water than the three eating English wheat)	103	71
Calcium intake total per person (daily)	466	328
Calcium output (daily) in faeces	530	353
Calcium output (daily) in urine	160	162
Total calcium output per person (daily)	690	515
Calcium balance per person per day	−224	−187

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[2] H. Chick and E. B. Slack, *ibid.*, 1948, **2**, 205.
[3] R. A. McCance, K. M. Prior, and E. M. Widdowson, *ibid.*, 1953, **7**, 98.
[4] R. A. McCance and C. M. Walsham, *ibid.*, 1948, **2**, 26.
[5] *British Medical Journal*, 1953 (Aug. 15), p. 385.

The Leonard Hill Technical Group

Articles published in some of our associate journals in the Leonard Hill Technical Group this month include:

World Crops.—Cocoa in the Belgian Congo.

Manufacturing Chemist.—Ampholytic Detergents.

Chemical & Process Engineering.—Ultrasonics in Industry.

Abstracts from Recent Food Literature

Startling Results at N.O.R.M. Pilot Plant. (*Canadian Food Industries*, 1953, **24**, 18).—A method of food preservation by the use of Dunkley gas is described. Foods packed in an atmosphere of this gas are protected from oxidation, loss of flavour, enzymic and catalytic rancidity, moulds, and aerobic bacteria. The Dunkley process has been put into practice at N.O.R.M. Industries Ltd., Montreal.

Determination of the Colour and Turbidity of Sugar Solutions. P. G. Odendaal (*The International Sugar J.*, 1953, **55**, 240).—Reasons are given why it is not deemed advisable to indicate the colour of a sugar solution by an absorption reading at one wavelength reading only. A new method is suggested to correct for the effect of turbidity when making absorption readings. The turbidity of sugar solutions is specified in terms of absorption readings.

Review of Practical Fluoridation. H. F. Munroe (*Ind. and Engg. Chem.*, 1953, **45**, 105).—Statistics are given to show that the cost of fluoridation is least with sodium silicofluorides, most with sodium fluoride crystals, but because of its more ready availability, sodium fluoride has been most used.

Solubility and Volatility of Propenyl Guaethol, Bourbonal, Vanillin, and Coumarin. L. C. Cartwright (*J. of Agric. and Food Chem.*, 1953, **1**, 312).—Methods and data on the determination of comparative volatilities of the four compounds are given.

Packaging Progress. C. L. Adcock (*J. of Agric. and Food Chem.*, 1953, **1**, 710).—A review of past, present, and future trends in food packing and processing.

High-frequency Heating as a Unit Operation in Meat Processing. L. J. Pircon, P. Loquercio, and D. M. Doty (*J. of Agric. and Food Chem.*, 1953, **1**, 844).—Data on a typical run show that a 15 kW high-frequency generator operating with a 56·6 per cent. conversion efficiency could possibly process more than 3,500 lb. of meat in an eight hour day. Disregarding initial investment, in processing large volumes of meat, the analysis suggests that the electrical process might compare favourably with steam.

The Preservation of Meat for Domestic Consumption. S. C. Lewis (*The Refrigeration Journal*, 1953, **7**, 34).—A description of methods of slaughtering and butchering beef animals, including freezing, shrinkage, cooling, and distribution, as carried out in Australia.

Classification of Sausages. H. Sedlmeier and L. Kotter (*Die Fleischwirtschaft*, 1953, **5**, 238).—The introduction of an official German classification of sausages on the basis of a scientific analysis of the different types is proposed. This would comprise "raw sausages," "raw frying sausages," "warming sausages," and "cooking sausages," each category being subdivided into three accurately defined degrees of quality. This classification would permit the inclusion of all types of sausages locally preferred in certain regions.

Caneliñas—Whale Cemetery. J. V. Sieiro (*Industria Conservera*, 1953, **19**, 198).—A description of one of the three factories in Spain concerned with the handling of whale products and by-products, including whale meat, oil, greases, and fertilisers.

The Nutrition-physiological Importance of the Basic Substances of Liquid Cocoa. W. Trendtel (*Fette und Seifen*, 1953, **9**, 607).—Most school children in Western Germany get a drink of cocoa or chocolate at school. Owing to a wide-spread prejudice, chocolate is usually preferred to cocoa. The author has carried out research on commercial cocoa products, testing durability, vitamin D and A contents, and sugar contents as well as a number of incidental nutritional properties. The tests have confirmed the high biological and nutritional value of the cocoa products.

Versatile Packaging Machine. (*Flow*, 1953, **8**, 109).—An automatic machine by Packmasters produces 3, 4, or 6 in. square packages at a speed of from 30 to 80 per minute. It can be fed by one to three operators and can incorporate a wide variety of small articles into a single heat sealed package.

Observations Concerning the Colorimetric Determination of Vitamin A Contents of Margarine. A. Schillinger, K. E. Schulte, and H. Sackmann (*Fette und Seifen*, 1953, **9**, 603).—The control of vitaminised margarine calls for reasonably reliable, practical methods for a rapid check of vitamin A contents. Many such methods have been suggested but none can, as yet, be regarded as wholly satisfactory. According to tests carried out at the German Institute for Food Chemistry, Munich, one of the best tests is the colorimetric method based on the Carr-Price reaction, and improved by H. Moor. The modified method can be further improved by drying the essential oils, resulting from saponification, through adding alcohol. Moor's method can also be improved by using a saponification agent without aluminium oxide, an ethereal solution of the agent being washed in water.

The Water-absorbing Capacity of Meat. F. P. Niinivaara and T. Ryynänen (*Die Fleischwirtschaft*, 1953, **10**, 261).—The Research Institute of the Co-operative Slaughterhouses, Finland, has carried out research on the effect of the preservation time, the common salt admixture, and the *p*H value on the water absorbing capacity of meat. Owing to the softness of the muscular tissues, water absorption is good just after slaughter. With the formation of lactic acid, the *p*H value decreases, the albuminous matters begin to coagulate, and the water absorbing capacity decreases until about 24 hours after slaughter. Subsequently, due to the effect of autolysis, the absorbing capacity increases again, reaching its final value after six to eight days.

News from the Industry

FORTHCOMING EVENTS

The Royal Institute of Chemistry

Among the meetings arranged by the Royal Institute of Chemistry for January is :

Jan. 20. "The Manufacture of Iron and Steel," by D. J. O. Brandt (with the London Section of the Society of Chemical Industry) at 6 p.m. at King's College Chemistry Lecture Theatre.

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The Institute of Refrigeration

"Steam Jet Refrigeration" is the title of a paper to be read by L. L. Forster before a meeting of the Institute of Refrigeration on January 19. This will be held at 5.30 at the Institution of Mechanical Engineers.

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The Society of Chemical Industry

The Microbiology Group of the Society of Chemical Industry has arranged the following meeting for January, jointly with the Society for Applied Bacteriology :

Jan. 13. Symposium on "Industrial Methods of Sterilisation," to be held at 2.15 p.m. at the Institution of Civil Engineers.

The following two meetings have been arranged by the Food Group :

Jan. 14. "Cacao Diseases," by Mr. R. V. Wadsworth and an afternoon visit to Somerdale. This is a joint meeting with the Bristol Section.

Jan. 27. "Nutritional Reappraisals —3. Vitamins and Newer Concepts," by Dr. L. J. Harris (Nutrition Panel Meeting).

*

Oxford University, Dept. of Education

A conference on "The Young Worker : Education for Human Relations" is to be held by Oxford University from April 3 to 9. It is intended to bring together representatives of industry, education, and administration and others concerned with the well-being of young people.

Food Group Conversazione

The seventh annual conversazione of the Food Group of the Society of Chemical Industry was held jointly with the Agriculture Group at the Borough Polytechnic by courtesy of the Principal, Dr. D. H. Ingall, who, with Dr. J. H. Bushill, chairman of the Food Group, and Mrs. Bushill, welcomed the guests.

Those present were able to inspect the beautifully arranged demonstrations of the work carried out in the different departments of the Polytechnic. In the cake decoration room were displayed the stages in the production of a wedding cake and decorative work carried out by students on wedding, Christmas, and birthday cakes, and the decoration of gateaux, and fancy and layer cakes.

In another department, members of the staff and students gave demonstrations throughout the evening of both bread and confectionery production. The bread demonstrations included plaiting, the preparation of "country types" of bread, and of "festival items." The confectionery demonstration included the production of afternoon tea fancies, almond goods, shortbreads, and various types of biscuit. Four window display units consisted of decorated confectionery, oven finished goods, such as puff paste, bread, and sugar confectionery.

Two of the laboratories housed comprehensive exhibits of the raw materials used in bakery and sugar confectionery and in other departments visitors saw the physical methods of flour testing and test baking in the well-equipped research bakery.

In the analytical laboratory were demonstrated the various methods for the analyses of food. Other exhibits included pest control, packaging materials, microbiology, and food hygiene.

The popular film show of the Food Group tour had a "full house" for both its sessions. The photography was outstandingly good and great credit is due to Dr. J. H. Oliver for his services in this connexion.

The attractive assortment of dishes, prepared by the teaching staff and students of the Department of Catering of the Polytechnic and served in the Edric Hall, were speedily disposed of by an appreciative assemblage.

B.B.I.R.A. Annual Meeting

The report submitted to the members of the British Baking Industries Research Association at its annual meeting contains a personal report from the Director of Research, Dr. J. B. M. Coppock, in which he summarises the progress made during the year, and indicates the research programme for 1953-54. The main divisions of the industry are covered and a number of research items described.

At the luncheon, chairman of council, Dr. R. T. Colgate, who presided, proposed the health of the guests to which Lord Horder responded.

Lord Horder expressed his deep interest in nutrition and, as a doctor, thought it would be in the interests of public well-being if the link between the bakery and milling industries was even stronger. Referring to his visit to Chorleywood, he said that he was tremendously impressed by the work going on there—it was research in its best form. Everybody paid lip service to research, but it was not lip service that was wanted; it was hard, slogging work.

At the "Any Questions" session held in the afternoon, members put questions to a panel drawn from principal members of the staff of the Association under the chairmanship of Dr. Coppock. A number of interesting technical points were raised, including those relating to the use of mineral oils for the purpose of lubrication, etc., the relative keeping qualities of white and national breads, and the use of chemicals in foods, this latter being dealt with by Dr. Coppock. He favoured the issue by the authority of a permitted list of substances which could be used by food manufacturers. He also assured his hearers that the Association had not ceased to work on the problem of flour improvers and were also carrying out tests on possible alternatives, such as the aeration process.

Bakery Education

At the sixth annual general meeting of the National Board for Bakery Education Mr. J. H. Stevens, chairman, presented a report of a successful year's work.

Mr. A. H. Allardyce of the Federation of Wholesale and Multiple Bakers was appointed chairman ; Mr. J. H. Beale re-elected hon. treasurer and Mr. C. H. R. Jarvis secretary.

During the course of the reception and Press conference in the evening, Sir Martin P. Roseveare, H.M. Senior Chief Inspector, Ministry of Education, presented Diploma Certificates, and Mr. Bert Willis, President of the National Association of Master Bakers, presented scholarship cheques to successful students.

Prophecies for A.D. 2000

In celebration of its bicentenary in March, 1954, the Royal Society of Arts is offering prizes totalling £500, the largest being £250, for conceptions of life on this planet in the year 2000. Forecasts (in visual or written form) are invited of the future developments which may be looked for in some particular aspect of life related to arts, manufactures, and commerce. For example, a competitor might give his ideas of what transport, housing, food, or clothing may be like in 2000. The chief criterion in assessing the entries will be originality.

Full terms and conditions relating to the competition, together with registration forms, may be obtained from the Secretary, Royal Society of Arts, John Adam Street, London, W.C.2. Registration forms must be completed and returned together with an entry fee of 1s. by February 15, 1954 and the actual competitive material submitted by June 30, 1954.

Analytical Abstracts

The Society of Public Analysts and Other Analytical Chemists has provided abstracts of the literature on analytical chemistry for readers of *The Analyst* ever since the journal was first published in 1876. For the last four years these abstracts were prepared by the Bureau of Abstracts and supplied to members of the Society and to subscribers to *The Analyst* under the title "British Abstracts C."

As the Bureau of Abstracts ceased to exist at the end of 1953, the Council of the Society has decided to resume publication of abstracts of analytical literature. "British Abstracts C" will be replaced by a new publication to be called *Analytical Abstracts*. This will be edited by Norman Evers, B.Sc., Ph.D., F.R.I.C., and it will cover the whole range of analytical literature in the same way as did "British Abstracts C."

Special arrangements are being made for members of kindred societies to obtain *Analytical Abstracts*.

General Managers Institute Formed

Over 100 chief executives attended the Inaugural Dinner of the Institute of General Managers at the Savoy Hotel, London, on November 20, 1953. Guests of Honour included Sir Rupert De la Bere, Bt., K.C.V.O., M.P., and Sir Patrick Hannon.

As the organisation devoted to the interests of general managers, the Institute is deliberately an exclusive body. In addition to the requirements of managerial experience and training, no candidate for membership can be accepted who does not hold a *bona fide* general management appointment at the time of his application.

One of the basic concerns of the Institute is the education and training of the younger men, the potential general managers, who are making their way in industry and commerce and who are the future leaders of the nation's enterprise.

A provisional Council has been appointed pending the appointment of a Council of 36 or more members including leading chief executives of all types of enterprise. Branches are being established in various centres throughout the British Commonwealth.

Because its membership is open to general managers and managing directors of every type of enterprise, the Institute, by branch functions and conferences, publications, and information and advisory services, makes possible among chief executives a broad interchange of management information, experiences, and problems by which members will increasingly benefit, thereby enhancing their personal value to their Boards of Directors.

New R.S.I. Committee on Food Hygiene

In view of the importance and wide public interest in clean food and food equipment, the Council of the Royal Sanitary Institute have instituted a Standing Committee on the Hygiene of food and food equipment. The work of this committee will be the correlation, development, and co-ordination of work on the hygiene of food and food equipment with special reference to the formulation of functional specifications related thereto.

The action taken by the Institute in setting up this Committee is particularly opportune in view of the Government's Bill to amend the Food and Drugs Acts 1938 to 1950.

Cake and Biscuit Conference

A one-day conference of the British Cake and Biscuit Association was held on October 16 at the Charing Cross Hotel, London, under the chairmanship of Mr. A. G. Smith, a Past-President of the Association.

The following papers were read:

Production

Biscuits. — (*a*) Uniformity of Production. Mr. A. Gilchrist (Wm. Macdonald and Sons).

(*b*) Enrobing of Biscuits. Mr. Albert Whittaker (Cadbury Bros.).

Cake. — (*a*) Relating Quality to Price. Mr. J. Price (Lever Bros.).

(*b*) Sponge Goods. Mr. E. G. Ellis (formerly director, Kearley and Tonge).

Science

(*a*) Packaging of Cakes and Biscuits—Problems of Humidity. Mr. P. Bilham (Chief Chemist, Symbol Biscuits).

(*b*) Research — Some Aspects of Rancidity Development. Dr. J. B. M. Coppock (Director of Research, British Baking Industries Research Association).

Engineering

(*a*) Plant Maintenance. Mr. L. A. Hind (Chief Engineer, Alfred Bird and Sons).

(*b*) Electronic Control. Mr. R. J. F. Howard (The Lancashire Dynamo Electronic Products.

Sales and Marketing

(*a*) Consumer Research. Mr. H. Henry (Market Information Services).

(*b*) Presentation. Mr. E. R. Conradi (Transparent Paper).

Both the morning and afternoon sessions were concluded by general sessions during which discussions were held, followed by summing up by the group chairman.

At the dinner which took place at the conclusion of the conference, Mr. Smith welcomed Mr. N. H. Howell, President-Elect of the Association.

Change of Name

The name of Van den Berghs and Jurgens (Sales) Ltd., distributors of Stork margarine, has been changed to Van den Berghs, Ltd. Their head office remains at Bridgwater House, Great Suffolk Street, London, S.E.1, and their provincial branch office addresses remain unchanged.

The board is composed as follows: Mr. Clive Van den Bergh, M.B.E., chairman; Mr. Julian W. Best, D.S.O., managing director; and Mr. E. V. Roberts, advertising director.

This change does not affect the manufacturing interest, which continues to be known as Van den Berghs and Jurgens, Ltd.

Self-service Food Store

The recent opening in Sutton, Surrey, of one of the largest and most modern self-service food stores in the country marked the entry of John Gardner (London) into the field of the retail selling of food.

Known for many years as industrial caterers and suppliers of food to the catering industry, the company decided to set up their own food store as a new outlet for their supply organisation. The decision to base the store on the self-service principle was made after two of the firm's directors had studied other stores of this kind in this country, on the continent, and in America.

It is one of the few stores operating on this principle where both meat and wet fish are sold, and although at present meat is served by sales people, complete self-service will be established later. The more perishable vegetables are kept in cold storage, and all are washed and prepacked.

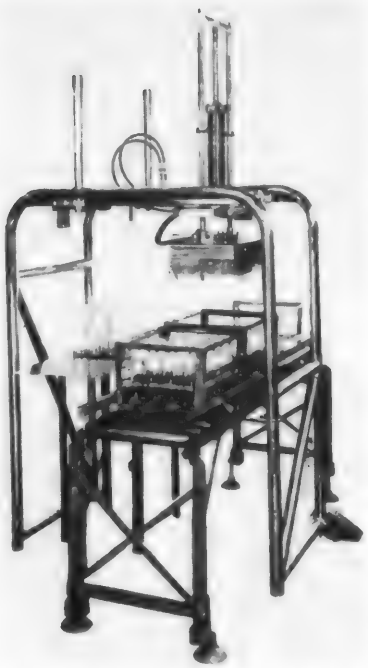
OBITUARY

Mr. Herbert Wooton Bell, general manager of the Midland Fruit Preserving Co., at the age of 73. Mr. Bell had been manager for 25 years and had spent most of his life in the food preserving industry.

Mr. R. A. Pepperall, Secretary to the Milk Marketing Board, at his home in Wimbledon on Monday, November 9.

After a military career in the Indian Army and several years' experience of farming in Australia between the wars, Mr. Pepperall entered the service of the Board in 1934. As Regional Officer in the Northern Region he quickly gained the respect and friendship of milk producers in the North of England. Later he moved to the Board's Head Office at Thames Ditton in the capacity of Chief Regional Officer and was appointed Secretary to the Board in May, 1948.

Mr. Pepperall was also Secretary to the National Milk Publicity Council.



The holder of the de-crating machine is about to descend into the crate to pick up the bottles.

Crating Machinery

A new labour saving range of machinery for crating, de-crating, and crate lifting has been produced by Clarke-Built. Speedy and safe operation of each machine is achieved by one operator. Thus, labour costs are reduced to an absolute minimum with substantial economies in running and maintenance. The new trio form a most attractive proposition not only to the dairy industry but also to the soft drinks and brewing trades, where mechanical handling is in every day use.

Specially constructed with a view to speeding up the loading of filled bottles into crates, the stainless steel crating machine is designed to operate to filler capacity. If through any cause the machine ceases to function, its installation does not interfere with the manual handling of bottles into crates. Up to 10 crates per minute can be comfortably dealt with by the de-crating machine.

The crate handling machine moves and stacks two crates at a time, loaded with filled bottles.

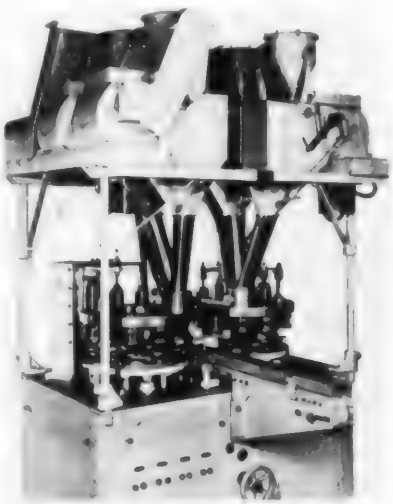
Milk Powder Packing Plant

Accurate weighing and the rapid filling of milk powder and similar powders which bulk above the container when filled can be achieved by the use of a machine produced by Autopack.

The tins are conveyed into the machine by conveyor which can link up with other machines, and are diverted into two rotors which feed them to the filling position where the exact quantity of powder is weighed in from four weighing machines giving an accuracy of ½ per cent. overall tolerance, weighing from ¼ to 1 lb. of powder.

While being carried round to the outlet, vibration is applied to settle the material down to the required level in the container. Spring loaded funnels with soft rubber washers sit on top of the containers, surplus material retained by this funnel and the feed plate above it being vibrated down as the containers pass through the machine. In the final stages of the passage through the rotor, pressure is applied to complete the settling down of the powder. The filled containers are finally discharged from each rotor on to the outlet conveyor which links up with the seaming machine.

Automatic controls ensure that no material can be discharged unless a container is actually in position and that no double or half quantities can be discharged at any time during the cycle of operations. Speeds of up to 70 per minute are possible according to the weight of material and the size of the containers being handled. A slower speed machine can be supplied consisting of one rotor only with a twin set of automatic weighing machines giving an output speed of 30 to 35 per minute.



Autopack milk powder packing plant.

Mechanical Aids in Package Handling

Packers are often discouraged by the evidence of poor handling of containers in transit and there is little doubt that much of the damage sustained by packages is caused by inefficient handling. There is little that the packer can do to control the treatment given to his goods after they leave his factory. There is, however, a great deal that can be done to improve the handling of packaging materials and filled containers during movement from one part of the factory to another or during the loading on to vans or wagons for the first stage of their journey. Manual handling, however experienced the operator, is expensive in time and labour and the use of an efficient system of mechanical handling generally results in a reduction of accidents with a consequent greater safety to the operatives and less damage to the goods.

With this in mind, the British Standards Institution has prepared a section of the Packaging Code (B.S. 1133, Section 4) dealing with mechanical aids in package handling. It describes the many types of equipment available and gives notes to assist users in selecting equipment and using it to the best advantage. This section contains about 80 illustrations of typical pieces of equipment likely to be of use to packers.

Fibreboard and Composite Drums

The British Standard for fibreboard and composite drums for oversea shipment has just been revised. The original edition covered only drums made entirely from fibreboard and the standard has now been extended to include drums with metal and plywood ends. Manufacturers of drums complying with the standard are invited to avail themselves of the facilities provided by the Institution's Certification Mark scheme which provides an assurance to users that the production of the drum has been subject to such supervision and testing as to ensure compliance with the standard.

No attempt is made to restrict the types of materials or methods of construction used and the standard is drawn up on a performance basis.

Plant Irradiation

As a result of considerable development work with the co-operation of the John Innes Institution and of the Electrical Research Association, on the subject of a practical method of accelerating the growth of young tomato and cucumber plants by the aid of artificial light, Benjamin Electric have available a special fitting for the purpose, based on the small vertical elliptical reflector.

Lamp for horticultural work.

Bulk Flour Deliveries

For the past three years, experiments have been carried out by Joseph Rank with a view to finding a satisfactory system of delivering flour in bulk, the aim being to design a road vehicle which can deliver flour direct into bakeries without any limitations as regards the height of the bakery storage bins.

In collaboration with Henry Simon and the Duramin Engineering Co., such a vehicle has now been devised and a demonstration was recently given at the Joseph Rank mill at Victoria Dock in London.

The chassis is a standard wheelbase Foden eight-wheeler powered by a Gardner engine and fitted with a 45 h.p. power take-off, which drives the ancillary equipment.

The body, which is constructed entirely of duralumin light alloy, was built by the Duramin Engineering Co., who have also been responsible for the installation of the ancillary equipment. It consists of a totally enclosed container, the capacity of which is 850 cu. ft., giving a payload of over 13½ tons of flour. The floor of the body is constructed to form three hopper bays down the full length, sloping slightly towards the rear. Three "air slides," approximately 9 in. wide, are incorporated in the bottom of each hopper bay, under which there are shallow troughs. Moisture-free air is introduced into these troughs from a Marshal roots positive displacement blower. The vehicle is loaded through three rectangular hatches situated on top of the body and the hatch covers when closed are sealed to ensure complete protection against the weather and contamination.

When air is introduced into the air slide troughs, the flour flows into a transverse hopper chute at the rear of the vehicle. This chute feeds a Simon blowing seal, which controls the flow of flour into the main air stream. The latter is provided by a two-stage positive displacement blower assembly, which produces sufficient volume and pressure of moisture-free air to carry the flour at a rate of over 20 tons per hour up a single pipe of 3 in. in diameter. For experimental purposes the flour has been lifted to a height of 100 ft., which is considered to be the maximum to which it will be required. There seems no reason, however, why this height should not be exceeded if necessary.

The vehicle is connected to the bakery intake installation by means of a flexible pipe, an operation which takes a matter of seconds. Delivery of a load of 13½ tons of flour can be effected in little over half an hour. It is of particular interest to bakers that only one three in. diameter pipe is required to feed from the vehicle to the storage bins, thus effecting a considerable economy on the three pipe delivery system so far as bakery installation costs are concerned. The vehicle can, however, deliver to bakeries which already have the three pipe installation, using one of the existing pipes, no modifications being necessary.

The delivery operation is controlled by one man from a control panel at the rear of the vehicle, on which are mounted separate controls for each of the air slides, the main air stream, and also a remote throttle control for the engine. There is also a tachometer on the control panel.

The Duramin Engineering Co. will satisfy the needs of Joseph Rank, but requirements of other companies will be built by Duramin and marketed by Henry Simon.

The eight-wheeler vehicle designed for bulk flour deliveries.

The preparation tables in the sausage making factory of Hughes Bros., Aintree, are veneered with Formica laminated plastic.

Electric Motors

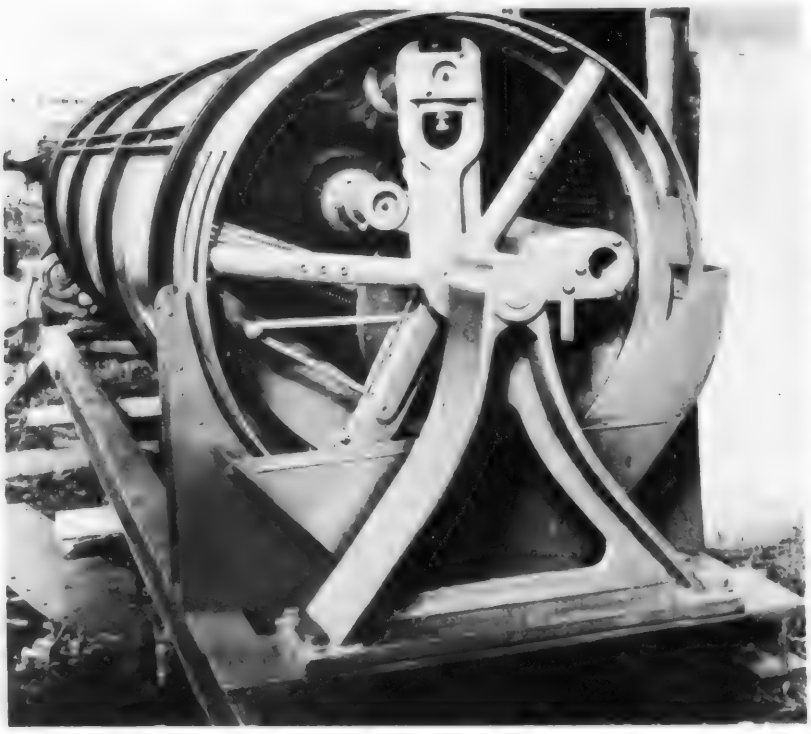
An S.E.M. electric motor was fitted to the Helpmate electric vehicle which won the Silver Medal in the Best Inventions Class at the 1953 Dairy Show. This vehicle is made by Helecs Vehicles.

In addition, seven other exhibitors used Small Electric Motors, in conjunction with their exhibits, and in the Poultry Section of the Show, the only motorised plucking machine was fitted with a Small Electric Motor, the manufacturers being Comb Pluckers Limited of Dorset.

Veneer for Food Shops

The latest methods of display and sales have been incorporated in the new Bilborough branch of the Nottingham Co-operative Society. In the self-service Food Hall on the ground floor groceries and provisions are displayed in cold storage cabinets. Rationed goods like butter and fats are prepacked into individual amounts of varying weights.

The clean bright counters displaying wrapped goods and the walls of this department and others on the ground floor are veneered with Formica laminated plastic sheeting.



Back view of the Goliath I for sorting peas and beans.

Sorting Peas and Beans

Machinery for sorting peas and beans, running continuously without attention, can be supplied by F. Bos, Ltd.

The Goliath I has an interior drum, studded with selection needles, which is suspended by coil springs and evens out the peas or beans in the drums, increasing the hourly capacity over the Goliath 2, by about half a ton. The former model separates up to 16 cwt. per hour with less than 1 per cent. faults.

The outer drum of the Goliath is made in two sections so that for cleaning purposes the top half can be raised, all parts being at once easily accessible.

The whole working is fully adjustable for the purpose of increasing or decreasing capacity according to the quantity of the product to be handled.

The machine, which has regulated feeding, is supplied as a complete unit.

British Motors for U.S. Market

A further major step forward in the company's drive for increased exports has been made by Brook Motors by the inauguration of their American company, the Brook Motor Corporation, of Chicago. The newly formed corporation has two American directors, both of whom have a wide experience of electric motor distribution throughout the United States.

A stock of motors of various types all designed specially for the U.S.A. market will be held in America to an initial value of £150,000. It is expected that an annual turnover, amounting to over one million dollars, will be built up within two years of operation. Stocking and servicing agencies are being established in various States and an extensive advertising campaign is timed to start early in 1954.

Other items to be marketed in the U.S.A. from the company's normal products will be explosion and flameproof motors, textile and loom motors, two speed dental lathes, and silent type motors, together with the firm's extensive range of control gear.

Evaporating Plant

Commodities that can be handled by the Lemale plants include fruit juices, milk and milk products, soups, meat extracts, pectin, and pharmaceutical products. Among those available are the normal calandria type, the ball type with stirrer, used for semi-solids and liquids, and the calandria type with thermo compression.

Of great interest is the low temperature evaporator (Fig. 1) constructed of stainless steel and supplied in four sizes ranging from capacities of 110 to 880 gal. This is a single effect evaporator, by which low temperature concentration of heat sensitive food products can be achieved. The maintenance of the vacuum and the condensation is assured by the air-ejector condenser (Fig. 2) which combines in one single unit the vacuum pump and the condenser.

The main organ is the mechanically operated turbine impeller, which draws water from an adjacent tank and discharges it at a high velocity from the periphery of the impeller and in the form of jets which enter the passage formed by two smooth circular plates.

The action of the impeller is sufficient to create a complete vacuum and to condense and discharge the steam between the two plates, also any air or gases that cannot be condensed.

The air-ejector condenser is the most powerful means of creating a vacuum and has the advantage of being simple in construction and not needing to be primed; it can also be used as an air pump.

A steam recovery plant can be used in combination with the above plant; such a plant has been installed in numerous dairies for the concentration of milk and whey, the condensed steam being pumped through the feeding tank of the boiler. It allows a 35 per cent. economy in steam under the normal consumption of a single effect plant. Its design permits of evaporation at a low temperature, which is an advantage over a double effect plant, in which the boiling temperature, in its first stage, is of necessity too high for many sensitive food products and affects the taste and colour and other properties. This plant, if required, can be fitted with a direct reading refractometer.

Vacuum pans used in the preparation of thick products, such as tomato concentrates, containing more than 35 per cent. solids are also

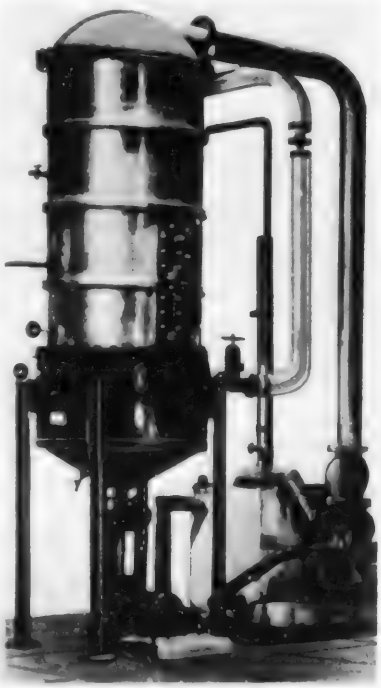


Fig. 1. Low temperature evaporator.

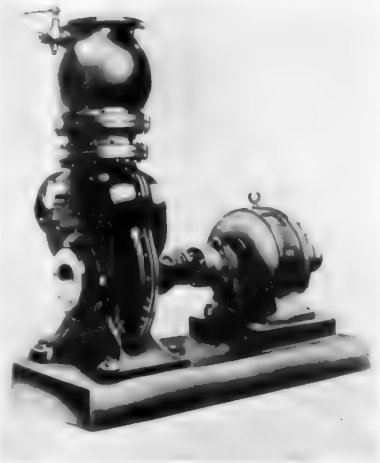


Fig. 2. Air ejector condenser.

manufactured. These can also be used in the preparation of jams and preserves under vacuum. A load of some 14 cwt. of pulp, syrup, or pectin can be introduced and after the evaporation of 3 cwt. of water in 20 minutes, 11 cwt. of a high quality product is obtained. Constructed in stainless steel, they are fitted with internal stirrers.

The British agents for the Lemale plants are Machinery (Continental) Ltd.

U.S. Patents for U.K. Commerce

First details have recently reached London of hundreds of American Government inventions which have been thrown open for the use of private industry on a royalty-free licence basis.

The inventions comprise processes, formulae, techniques, and new raw materials discovered by U.S. Government research laboratories and agencies, protected by patent and not required for national defence. They are made available to private enterprise through the U.S. Department of Commerce.

Some two years ago the first list of available inventions was issued. The second list, with the latest additions, groups the inventions into the main fields of use, and then subdivides them.

Modern Gas Equipment for Students

To ensure that its students have the latest equipment to work with and to help maintain its international reputation, Cardiff College of Technology and Commerce has recently had modern gas-fired equipment installed in its bakery, confectionery, and catering department.

Latest additions to the gas equipment installed are two Ascot instantaneous controlled hot water units. These followed the replacement of its old gas ranges by new gas-fired equipment. Gas appliances in the bakery include two Cox's double-deck ovens incorporating a Vienna Oven; a gas-fired Thermspray boiler; gas provers; two gas-heated hotplates for baking pikelets, welsh cakes, etc.; two Ascot multipoint water heaters with automatic water tempering devices, as well as numerous gas points used by the students particularly for sugar sweet making. In the catering department are two central unit 4-oven ranges fitted with bain marie and hot closet; a gas boiling table, salamander, gas steamer, and stock pot stove.

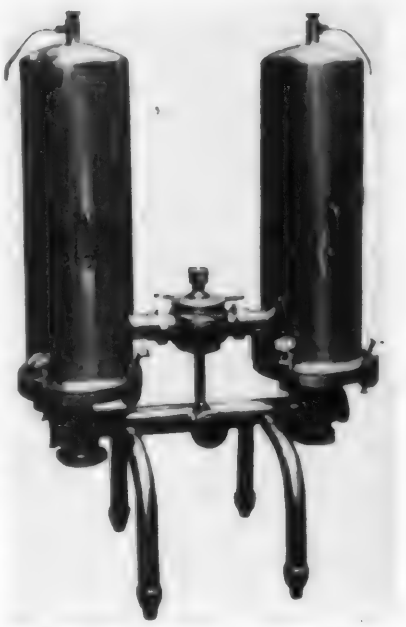
Smoked Turkey

After two years of experimentation in processing methods, the first smoked turkey to be offered on a commercial scale in Great Britain is being marketed by an East Lothian firm. The convenor of the poultry committee of the National Farmers' Union in Scotland, Mr. R. G. Chalmers Watson, has been a leading figure in the drive to get turkey breeding established as a major industry.

Birds are fattened, killed, and processed in Scotland, packed on ice, and sent to London where the smoking process is completed. This includes pickling in herbs, treatment with spices, and bathing in wine. The ten-day routine which has been evolved results in the production of a specially flavoured meat of good keeping qualities which has already found acceptance in the catering industry.

British Plant for New Zealand

When New Zealand cheese factories found that consignments of cheese sent to the U.S.A. were being rejected on grounds of failure to pass the sensitive sediment test, A.P.V. were requested, through their New Zealand agents, J. B. MacEwan and Co., to supply a large capacity filter capable of handling throughputs of 2,500 to 10,000 gallons per hour and at the same time produce a sediment-free product.



Stainless steel 2,500 to 10,000 gallons per hour filter.

Within four months the company had designed, manufactured, tested, and despatched a new filter which has since given every satisfaction in service. Known as type LD, this all stainless filter is a high capacity dual-chamber change-over type with a three-way cock which directs the milk to each chamber in turn, permitting filter cloths to be replaced without interrupting the run.

The sock-type filter cloths are carried on perforated tubes within the outer chambers which are fitted with lifting handles to facilitate removal. Each chamber contains a large diameter displacement cylinder to reduce the volume of milk which must be drained off when it is required to remove the outer cylinder. Each chamber is provided with a drain cock, automatic non-return valve in the base, and a vent fitting at the top. The whole unit is carried on a tubular frame with ball-ended feet.

Students of Cardiff College of Technology and Commerce at work in the bakery.

Mr. and Mrs. Sydney G. Bailey.

Tributes to Mr. and Mrs. Bailey

The retirement of Mr. Sydney G. Bailey, O.B.E., Secretary of the Cake and Biscuit Alliance Ltd., has been announced. He is the man whom Great Britain's cake and biscuit industry appointed to administer the Government's controls of their raw materials and production during the war-time shortages.

In paying tribute to Mr. Bailey at the Annual General Meeting, the chairman of the Alliance, Mr. Rupert E. Carr, referred to his outstanding work in welding the industry together into one united team, to the supreme confidence which manufacturers felt in his dealings on their behalf with Government Departments, and to the inspiration he had been to all members by the courage and resolution he applied to problems both dangerous and delicate.

Retiring with her husband to a well-earned rest in Monmouthshire is Mrs. L. E. Bailey (better known to many people in the biscuit industry as Miss L. E. Howard), who for 13 years has worked beside her husband as Allocation Officer and Personnel Manager.

Mrs. Bailey has led a varied and busy life; she served for 18 years on the Committee of the British Federation of Business and Professional Women and was Secretary for four years. At present she is Vice-Chairman of the Chelmsford branch of the National Federation of Business and Professional Women's Clubs.

The partnership of Mr. and Mrs. Bailey is probably unique in industry and one which must have given them great and personal satisfaction and happiness.

APPOINTMENTS AND RETIREMENTS

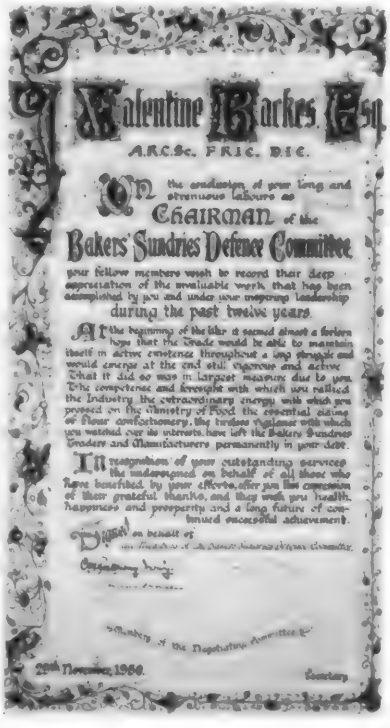
The technical representative for the counties of Yorkshire, Lancashire, Cheshire, and Northumberland for Premier Colloid Mills is now Mr. Ronald V. Arnfield, B.Sc., A.R.I.C.

*

At the recent annual general meeting of the Bakery Allied Traders' Association, Mr. J. Valentine Backes, in his Presidential Address, announced his retirement from the Presidency as his three year term of office was now completed.

Mr. C. M. Trelawny Irving paid tribute to the work of the President during and since the war on behalf of the Association. He referred to the vast amount of time that Mr. Backes had expended in achieving so much for members, and said he looked forward to the continued help and guidance which he knew Mr. Backes would be only too happy to give on the Council.

Mr. Backes founded the Bakers' Sundries Defence Committee as far back as 1938, and after 12 years as chairman successfully merged this organisation with the Bakery Allied Traders' Association, taking over the Presidency in 1950. Among the many tributes he received from all sections of the trade, and various Divisions of the Ministry of Food, was an illuminated address, reproduced here. It reiterates the appreciation of the industry for his outstanding work.



Valentine Backes Esq
A.R.C.Sc. F.R.I.C. D.I.C.
On the conclusion of your long and strenuous labours as
CHAIRMAN of the
Bakers' Sundries Defence Committee
your fellow members wish to record their deep appreciation of the invaluable work that has been accomplished by you and under your inspiring leadership
during the past twelve years
At the beginning of the War it seemed almost a forlorn hope that the trade would be able to maintain itself in active existence throughout a long struggle and would emerge at the end still vigorous and active. That it did so was in largest measure due to you. The competence and foresight with which you rallied the Industry, the extraordinary energy with which you pressed on the Ministry of Food the essential claims of flour confectionery, the tireless vigilance with which you watched over its interests, have left the Bakery Sundries Traders and Manufacturers permanently in your debt.
In recognition of your outstanding services the undersigned on behalf of all those who have benefited by your efforts offer you this expression of their grateful thanks, and they wish you health, happiness and prosperity and a long future of continued successful achievement.
Dated this on behalf of
Chairman of the Deputation Committee
Secretary of the Deputation Committee
29th November, 1950.
Secretary

He also received a Silver Salver to the golfing section of the B.A.T.A. to be known as the Valentine Salver, to be competed for at the Spring and Autumn Meetings.

Mr. Backes contributed the first article in the first volume of FOOD MANUFACTURE in 1927.

*

The Milk Marketing Board, at their November meeting, appointed Mr. H. Cooke to succeed the late Mr. R. A. Pepperall as Secretary to the Board.

Mr. Cooke joined the Board in 1935, and during the whole period of his service has been engaged in dealing with secretarial matters, first as Enforcement Officer and then as Assistant Secretary.

*

It is announced that Mr. George W. P. Page, A.C.G.I., A.M.I.E.E., has retired from the staff of the Publicity Department, The British Thomson-Houston Co.

Since Mr. Page joined the company in 1923, his chief responsibility has been the preparation of articles for the Press.

Honour for Mr. V. A. Patterson

Mr. V. A. Patterson, J.P., managing director of J. and E. Hall, was made an honorary freeman of the Borough of Dartford. The freedom was officially conferred on December 4.

Meat Trade Exhibits

Among the Oppenheimer features at the Smithfield Show were new aspects of sales promotion for the industry and many new production recipes.

During the past few months many enquiries have been made in widespread areas regarding sales promotion in the meat trade and the company have recently instituted a new department for the specific purpose of boosting sausage sales and of making the British public more "sausage conscious."

Hypak printed synthetic casings for the successful marketing of all forms of cooked sausage and cooked meats were also featured. Another exhibit showed the hygienic and protective packaging of foods, mechanical spares and clothing, with a special section devoted to the packaging of poultry.

Change of Address

Norman Engineering Company have extended their Northern Office to meet increasing sales. The new address is 273, Royal Exchange, Manchester, 2. Telephone: Blackfriars 1033.

The Voyage to Freedom

A function, organised by the Cake and Biscuit Alliance, was held on November 4 at Derby House, Stratford Place, London, in celebration of the advent of freedom in an industry which was only able to survive and to supply biscuits to the public during the extreme war-time shortages of ingredients because the whole biscuit industry agreed to submit its economy to the control of its own centralised organisation.

This control was so strict in all details that each manufacturer was allotted his quota in sugar, fats, and all scarce materials in units which, in some cases, had to take account of quantities only finally adjustable in pounds avoirdupois!

Now that flour, sugar, fruits, and glucose are freed, to be followed shortly by fats, manufacturers will be able to offer an ever increasing variety of biscuits, not only pre-war favourites, but also many new varieties.

The use of biscuits "round the clock" was illustrated by exhibits in the ballroom of Derby House which showed the correct type of biscuit to take with tea, coffee, milk, drinking chocolate, cocoa, and wine. In another room was arranged a number of small display cabinets containing the special "lines" of many biscuit manufacturers.

An interesting historical note was provided by an exhibit of biscuits found in 1913-1916 by Sir Aurel Stein during his third Central Asia expedition. These were discovered among food offerings deposited in the graves of Asians who lived during the seventh century. Many of these biscuits bore a striking resemblance to some of today's varieties.

Exhibits showing the use of biscuits "round the clock."

Fluorescent Lighting for Cold Stores

The lighting requirements in a cold storage room are similar to those of any other store where the work consists of handling relatively bulky objects in rooms of large floor area, and with comparatively low ceilings. Chief of these requirements is an evenly distributed illumination over the whole floor area, extending as far up the walls as possible, coupled with low brightness of the source of light, to avoid glare. An intensity of 7 to 10 lumens per sq. ft. is satisfactory. In addition it is advisable that the lighting fittings should generate as little heat as possible in order to minimise the load on the refrigeration plant. The atmosphere is normally dry, but becomes saturated when defrosting is carried out; therefore the fittings must be moistureproof and well protected against rust.

The fluorescent tube is clearly the most suitable light source, but hitherto it has not been used because of operational difficulties at low temperatures. When the standard circuit and components are used, starting is uncertain and the light output low due to the very low ambient temperature. These difficulties have now been overcome as a result of experiments carried out by the General Electric Co. through the courtesy of Sainsbury's at the latter's cold storage depot in Southwark, and an entirely satisfactory fluorescent lighting system for such surroundings has been evolved.

The temperature in the cold storage rooms is −14°F. The supply is 230 volt 50 cycles, and control gear rated at 220 volts is used to increase the tube current, thus compensating for the reduction caused by the low temperature. The capacitive circuit, comprising choke and capacitor in series, is used as this provides greater stability.

The fitting used is totally enclosed, and proof against dust and moisture. As the fitting is unventilated, the air surrounding the tube is soon warmed up, thus enabling the tube to operate at a sufficiently high temperature to produce its full light output.

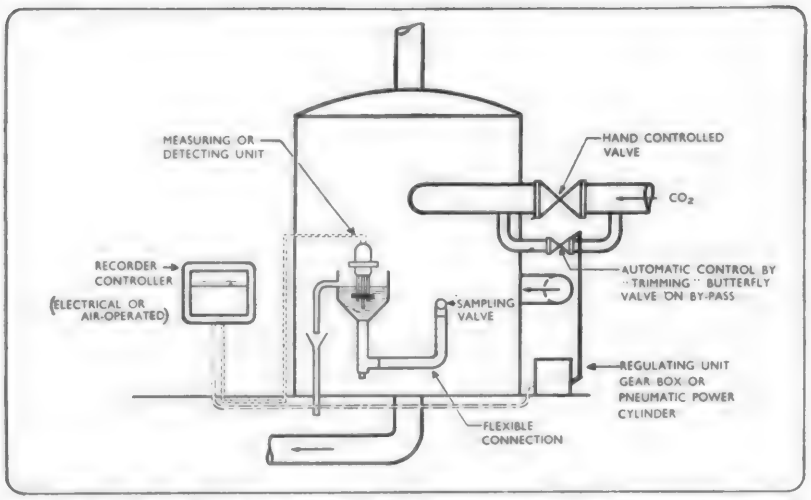
Treatment of Pea Viner Waste

An experimental department report on the treatment of pea viner waste has been issued by Powlings Patent Processes.

Five thousand and forty pounds of raw material were treated and the weight of Protess and wet fibre produced with their analyses are given together with that of the supernatant water. The hourly cost of running is also given.

Copies of the report can be obtained from the company.

G.E.C. dustproof and moistureproof fluorescent lighting fittings in Southwark cold storage depot of J. Sainsbury Ltd.


MEASURING OR DETECTING UNIT
HAND CONTROLLED VALVE
CO_2
RECORDER CONTROLLER (ELECTRICAL OR AIR-OPERATED)
AUTOMATIC CONTROL BY "TRIMMING" BUTTERFLY VALVE ON BY-PASS
SAMPLING VALVE
REGULATING UNIT GEAR BOX OR PNEUMATIC POWER CYLINDER
FLEXIBLE CONNECTION

Typical scheme for second carbonatation control. *Photo George Kent Ltd.*

Automatic Control in the Sugar Industry

The extraction of sugar, from both beet and cane, is a seasonal operation lasting from 10 to 16 weeks in the year, depending on the location of the factories. During this period it is essential that the plant runs continuously at peak efficiency, and that every possible means be employed to extract the maximum amount of sugar in the shortest possible time. Instrumentation and automatic control of the various processes not only increase plant efficiency but also ensure consistency in the quality of the raw sugar.

The critical processes of carbonatation lend themselves readily to instrumentation. The first carbonatation process calls for some means of determining the "break" point; some sugar technologists favour *p*H measurement, while others prefer conductivity measurement. The equipment used for conductivity measurement may be standard, consisting of two electrodes working in conjunction with a potentiometer/recorder. If the first carbonatation is a continuous process, automatic control is possible, the regulating means consisting of a butterfly valve in the carbon dioxide line.

The second carbonatation is usually a continuous process and is admirably suited for automatic *p*H control. It now appears to be firmly established that this process should be controlled to maintain the *p*H value of the juice in the region of 9. For this application, the glass electrode with potentiometer/recorder/controller has proved satisfactory. A standard range of 6-12 *p*H is used, the constant *p*H value being obtained by controlling the admission of carbon dioxide to the carbonatation tanks. A typical layout of the control scheme is shown in the illustration.

Experience has shown that entirely satisfactory control is achieved when the control valve is used for "trimming" purposes, *i.e.* the valve, usually between 2 in. and 4 in., is placed in a by-pass round the main valve. The latter is set by hand and locked in order to pass slightly less carbon dioxide than is required to maintain optimum *p*H value of the juice. The duty of the automatically controlled valve on the by-pass is then to make up the deficit and maintain the *p*H at a constant value.

The *p*H measuring equipment is temperature compensated in that the electrodes themselves are compensated for temperature so that the instrument always measures the actual *p*H value of the liquid at the temperature obtaining.

Automatic control can be used to advantage on a number of processes, apart from carbonatation, in the production of sugar. Control of Brix, sulphitation and liming, and boiler control of the steam-raising plant, are examples which considerably increase plant efficiency.

Coronation Commemoration

In the presence of the Mayors and Mayoresses of Chichester, Lewes, Arundel, Brighton, Hastings, Worthing, and Hove, Mr. William Teeling, M.P., Mr. Anthony Marlowe, M.P., Councillor A. J. Broomfield, chairman of the Portslade U.D.C. and other civic officials, together with the staff of the factory, the Duke of Norfolk planted a tree in the forecourt of the soft drinks factory of R. Fry and Co. on November 23 to commemorate the Coronation.

His Grace was introduced by Mr. Clifford H. Wallis, chairman of the company, who presented the Duke with a replica of the spade used to plant the tree.

Following the ceremony, the Duke toured the factory with those attending the ceremony and saw the manufacture of a new soft drink known as Sunfresh. This is produced with fresh oranges instead of imported juice.

Reconstruction of Sugar Factory

A comprehensive scheme of reconstruction at the Allscott factory of the British Sugar Corporation at Wellington, Shropshire, involving an expenditure of £800,000 over the past four years, has now been completed, and the factory is turning out the best grade of granulated sugar at the rate of 300 tons a day.

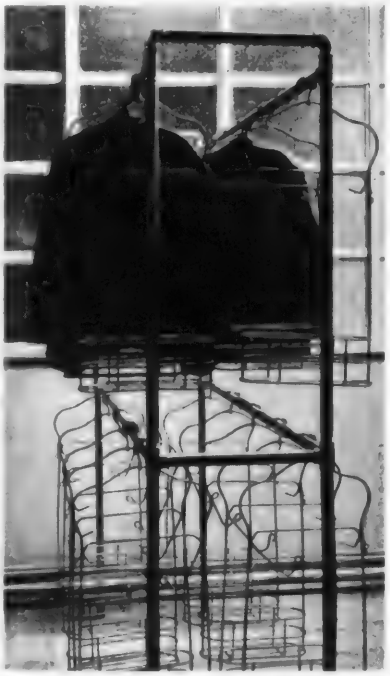
Before and during the reconstruction of the factory, the sugar from the beet was sent to the Kidderminster factory of the Corporation for refining, but that work is now being done at Allscott and the refined sugar distributed for sale. The bulk of the beet used at the factory is grown in Shropshire.

Clothes Storage

The problem of clothes storage in factories can be solved by the use of the patented Sieber method. The provision of lockers is not always suitable as dirt and particles of food accumulate, thus providing breeding grounds for vermin; also cleaning and disinfecting of lockers is difficult and costly.

Sieber hanger equipment has been designed to make impossible the accumulation of dirt or parasites; in addition, the correct hanging of garments allows for airing and drying as well as preservation of wearing apparel. The use of costly floor space is reduced to a minimum and the solid construction of the hangers makes maintenance charges virtually non-existent.

The cost of the hangers is less than 35s. per worker, and the manufacturers provide a free planning service to all enquirers.



Clothes hanger equipment for factories.

Fish Canning Prospects

Following the relaxation of Australian import restrictions, fish canning at both Fraserburgh and Peterhead has revived to something approaching the previous level.

Herring packs were a major line for Australasia prior to the cuts and the ban made substantial reductions in employment in north-eastern Scotland. Although Government contracts and other packing alternatives were provided to replace the lost herring markets, these met with only limited success.

The present position is regarded as much more satisfactory and as offering excellent prospects for 1954.

Bakery Craft Courses

Some time ago it was announced that intensive training courses in various bakery craft subjects would be held at the National Bakery School, Borough Polytechnic.

The first of these four weeks full-time courses has now been successfully completed. Those attending specialised in cakemaking, and gained a knowledge of the various types of cakes produced by the baking industry.

It is now proposed to hold another intensive craft course to commence on February 1, 1954, to run for four weeks.

The craft subject for this course will be pastries and gateaux suitable for high class confectionery trade, buffets, and weekend specialities. Later on in the session it is intended to hold another intensive craft course in cake decoration if sufficient people are interested.

ERECTIONS AND EXTENSIONS

Plans are being made by Gorries, Ltd., to reconstruct and carry out extensions to their sausage factory at 1183, Chester Road, Stratford.

■

Premises have been purchased by Mayfair Products, manufacturing confectioners, at Grangetown for conversion into a new factory.

■

Construction of a £160,000 bakery on a site at Tindale Crescent, Bishop Auckland, is now in hand for Bishop Auckland Co-operative Society.

■

A new warehouse is planned for erection in Rodney Road, Portsmouth, by Oxo.

■

New premises are to be erected by Coca-Cola Southern Bottlers on a site at Emery Road, Brislington Trading Estate, Bristol.

■

A new bakery is to be erected by Welfords Cleveland Bakery, of Redcar, at an estimated cost of £69,274.

OBITER DICTA

● It is quite out of order to throw eggs. — *Speaker of the House of Commons.*

● It looks, after all, as if man will succeed in outwitting the insect. — *World Health Organisation.*

● Let us eat and drink again, but not everything at once. —*Josephine Terry, writing in the "Manchester Guardian."*

● You can talk until you are hoarse about the nutrition in bread, but it does no good if the people will not eat it. —*Lord Horder, speaking at a B.B.I.R.A. luncheon.*

● We should not be afraid of eating food containing chemicals; we have survived through many ages despite an addiction to sodium chloride — common salt.—*Lord Woolton.*

● Steps should be taken to teach the ladies and their 'tubby hubbies' that apples and pears are slimming. — *Mr. John Baker White, speaking at the annual luncheon of the East Kent fruit show.*

● How many times have you heard of a packing engineer being called to give his views as to the "packability" of a product? Come to that, how often have you heard of a packing engineer? — *John E. Evan Cook, J.P.*

● America knows how to sell, and one of the major commodities she knows how to sell is food; so successfully, in fact, that many people are eating far more than they should. *Daphne Barnes, writing in the "Manchester Guardian."*

● We are aware that bread has long nourished mankind; we eat a substance which, we are persuaded, is bread; the fact that it is an emasculated, bleached, inflated imitation does not prevent us from being nourished. — *Edward Hyams, writing in "The New Statesman and Nation."*

● The Ministry of Food recently sent packets of milk in tablet form to schoolchildren who cannot easily be supplied with liquid milk; hard sucking is needed to dissolve each tablet and one can imagine the village school being turned into a roomful of suckers. — *"Manchester Guardian."*

Plans have been drawn up by Burton's Gold Medal Biscuits, of Blackpool, to carry out extensions to their bakery, finishing, and packing departments.

*

The Bristol branch of the Danish Bacon Co. are seeking permission to construct a curing factory and warehouse on a site at Anthea Road, Clay Hill, St. George, Bristol.

COMPANY NEWS

A net decrease in total export business was reported by Sir Harry Jephcott, M.Sc., F.R.I.C., Ph.C., at the 19th annual general meeting of Glaxo Laboratories. This he attributed to the imposition of import restrictions, notably in Australia, Pakistan, Brazil, Argentina, Italy, and certain smaller markets. Fortunately it had been possible to mitigate the effect of such restrictions by a reduction of stocks, and sales by subsidiary companies fell by only about 4 per cent. On the other hand, home revenue from sales showed a small increase, price reductions made during the year being more than offset by the greater volume of business.

The total ordinary dividend proposed for the year was 17½ per cent. compared with 15 per cent. paid in the previous year.

BOOKLETS RECEIVED

Produced to help those studying biology in schools and universities when choosing a career and shaping their studies, the booklet "Biology as a Career," published by the Institute of Biology, presents an up-to-date review of opportunities for the professional biologist.

■

The two latest booklets issued by G. and J. Weir deal with quick freezing and refrigeration for the dairy and ice cream industries.

■

The booklet "Crosfield Detergents in Bottle Washing" will serve as a practical reference for all concerned with the economical and efficient running of bottle washing machines.

■

The fifth in a series dealing with the uses of rubber in building, a new brochure issued by the British Rubber Development Board enumerates the advantages of paints incorporating natural rubber for the benefit of architects, surveyors, builders, owners, and others.

Correction

Through an oversight, the words "Successors to Cherry-Burrell Ltd." did not appear in the Clarke-Built advertisement published on page vi of the December, 1953 issue of FOOD MANUFACTURE.

World Food News

Sugar Factory for Israel

Israel's first sugar factory is to start production at Ramat Gan early in 1954 and will be marketing its products by next August. Owned by the Prisukar company, a subsidiary of Priman, the factory will use local sugar beet and is expected to produce in its first year of operations 1,200 to 1,500 tons of sugar syrup to be used by sweets and chocolate factories, thus saving the country foreign currency. In its second year, Prisukar will start producing enough granulated sugar to cover 30 to 40 per cent. of local consumption.

Alignment of Empty Cans

A unique machine that aligns disarranged empty cans in an upright position ready for filling, at a rate of 1,500 per min., has been designed and patented by the French Sardine Co., Terminal Island, California, to simplify handling their 700,000 daily output of canned tuna fish. The machine employs a magnetic system to arrange the cans in their open position, bottoms down, only two operators being required.

The machine layout involves the following primary parts: (*a*) a steel incline ladder conveyor, 32 in. wide and 25 ft. long, into which cartons of empty cans are unloaded in disorderly piles; (*b*) V-bottomed bin vibrators that shake the cans into a vertical on-end position; (*c*) magnets, which attract the cans to tilt them with their bottoms downward; (*d*) a conveyor with a Neoprene plastic belt leading to filling machines; (*e*) steel baffles to align the cans in single rows on the conveyor belt.

One operator is located at the base of the 60 deg. inclining conveyor to unload the cans. The second operator is stationed on a steel-ramped mezzanine near a push button panel that controls the operation. Cartons of empty cans are ripped open by the unloading operator and discharged on to the conveyor leading to the steel-ramped mezzanine. The conveyor is "compartmented" every 4 in. with steel ledges which hold the cans in place. Rubber fingers—spaced every 4 ft. above the conveyor—catch any cans that slip out of these compartments.

Driven by a 2 h.p. motor, the incline conveyor rises to the mezzanine level and drops the cans over a roller into one of 3 V-bottomed bin vibrators. These bins, whose sides move horizontally at 60 strokes per minute, shake the cans into a vertical on-end position. Neoprene coverings on the sides of the vibrators protect the can seams. Moving in an end-on position along the bottom of the bins towards the exit, the cans pass through the magnetic section where they are positioned at a tilt with their bottoms downward. They leave the vibrating bins through a wire guide and roll on to the Neoprene conveyor belt — which operates at 150 ft. per minute—with their open side up. As they move down the belt, they form into single lines through the steel baffles and are conveyed to filling machines on the floor below.

Australian Type Culture Collections

At the British Commonwealth Specialist Conference on Culture Collections of Micro-organisms, held in London in August, 1947, it was recommended that a directory of important culture collections in the Commonwealth should be prepared, and that each institute maintaining a culture collection should prepare and distribute a catalogue in a form recommended by the Conference.

This Directory and List of Cultures has now been compiled from information submitted from 42 institutions, all of which are listed in the Directory, although a few do not maintain culture collections or do not consider their collections suitable for inclusion in the list in their present state.

The List of Cultures is divided into sections corresponding to different branches of microbiology. Opposite each species name the code numbers of the collections maintaining it are given. These code numbers have been segregated under three headings:

TC.—Type cultures obtained from some recognised culture collections such as the National Collection of Type Cultures (N.C.T.C.), American Type Culture Collection (A.T.C.C.), and others.

AC.—Authentic cultures whose identity is guaranteed by the curator of the collection or other recognised expert.

OC.—Cultures whose authenticity is not guaranteed by the curator of the collection, whose source is not from a recognised TC collection, or whose species name is in doubt.

Species are listed under only one name and in most instances the authority for the name has been given. Names of bacterial species are those used in the sixth edition of Bergey's "Manual of Determinative Bacteriology." Cross references to other commonly used names have been given where necessary.

Where possible the names of sporing yeasts are those specified by Stelling Dekker.

Bakery Equipment Standards

A Sanitation Standard for cake depositors, fillers, and icing machines has been published by the U.S. Baking Industry Sanitation Standards Committee.

Protection of Foods

A transparent plastic casing that is shrunk to fit snugly over the contour of foods is solving handling, preservation, and brand identity problems for Scott Peters Co., Chicago, Illinois, and is also contributing to a quality improvement that is substantially increasing output and sales promotion.

The casing, a Saran-type copolymer, promotes better appearance, retention of flavour, and maintenance of colour even under severe fluorescent light exposure. In addition, it prolongs the storage life of meats and provides a protection against weight loss. Attractively printed in several colours, the casing, which is non-greasy and applicable in a few seconds, ensures product identity and permits examination by the customer without handling.

Providing a tight-fitting "second-skin" cover—achieved by a vacuum-dipping process—the film is being used for a variety of products, including veal, ham, olive, and pepper loaves; sausages with natural casings; cheese; baked hams with glazed-sugar coatings, cherries, and pineapple slices; and heavily smoked products.

The casings are fabricated from seamless, extruded tubing which has been orientated or stretched to produce the desired shrinking action when immersed in hot water. The rounded bottom seam of the casing ensures a closer conformity to the product without awkward protruding corners. After the product has been placed in the film casing, the printed area is centred by the operator to provide maximum display value and identification. Next, the open mouth of the casing is held firmly around a vacuum nozzle where a 15 in. vacuum exhausts air from the casing, causing it to draw in tightly against all product surfaces. The operator then rotates the product to twist the neck of the casing and, by means of a foot-operated device, applies an aluminium neck band to provide an airtight seal. Shrinking to a final close fit is achieved by dipping the product for an instant in water just below boiling point.

Storage of Pears and Apples

Plastic film lined boxes can be used to lengthen the storage life of pears and apples. Pears sealed in film at 31°F. can be stored one or two months longer than non-filmed fruit and still ripen with excellent quality.

Generally, the liners should be perforated or slit when apples are removed from cold storage to prevent off-flavours at higher temperatures.

OVERSEAS ENQUIRIES

Frying Fat (Shortening)

Stanley V. S. Albury and Son Ltd., P.O. Box 43, Nassau, Bahamas, who handle large quantities of frying fat (shortening), would be glad to receive quotations from United Kingdom manufacturers.

Interested United Kingdom firms should communicate direct with the Nassau firm at the address mentioned above. Prices should be quoted c.i.f. Nassau.

*

Chocolates and Easter Confectionery

Mr. Edward I. Katz, 5628, Hempstead Road, Pittsburgh, wishes to contact United Kingdom manufacturers of bar candies, box chocolates, merchandise, and candy suitable for Easter trade.

United Kingdom manufacturers interested in this enquiry should write direct by air mail to Mr. Katz at the above address, submitting full particulars of their products, together with samples where possible and quoting c.i.f. prices in dollars, etc.

In order to avoid the possibility of damage in transit it is essential to ensure that any samples sent by post to the United States are carefully and securely packed. Duty is normally payable on samples imported into the U.S.A. unless the value does not exceed one dollar.

*

Sliced Pie Apples (Solid Pack)

The Speciality Food Sales Co., 1149, Magazine Street, New Orleans, wish to contact United Kingdom suppliers of sliced pie apples (solid pack) in No. 10 cans ($\frac{3}{4}$ gal. or 173·25 cu. in.).

United Kingdom suppliers interested in this enquiry should communicate by air mail direct with the U.S. firm forwarding quotations, c.i.f. dollar prices, and delivery dates, and it would be advisable to supply samples if possible.

*

Spices, Soup, and Sauces

Hans Georg Moller, of Hamburg-Altona, Friedensallee 120, are interested in representing United Kingdom producers of spices, soup, foodstuffs, and sauces.

United Kingdom manufacturers interested in this enquiry should communicate direct with the company at the address shown above.

*

Blackcurrant Jam

The Commission Company of 1503, Western Avenue, Seattle, Washington, have expressed an interest in importing direct from the United Kingdom supplies of blackcurrant jam. They would prefer the jam to be packed in 1 lb. glass jars or in tins.

United Kingdom firms interested in this enquiry should write direct by air mail to Mr. S. Levy at the address given above, submitting full particulars of their products together with samples where possible, and quoting prices in dollars c.i.f. U.S. port. The delivery position should also be stated.

*

Representation for Toffee

A. Newberg and Co. Inc., 209, Little East Neck Road, Babylon, New York, are interested in representing United Kingdom manufacturers of toffee in bulk and in tin boxes. The firm state that they are in a position to place orders between 100 and 200 tons.

United Kingdom manufacturers interested in this enquiry should communicate direct by air mail with the United States firm at the address given above for further particulars.

All foodstuffs destined for the United States are subject to the United States Food and Drugs Administration Regulations.

Margarine Manufacture in E. Africa

Unilever of Rotterdam have concluded an agreement at Nairobi with the Industrial Management Corporation and the Colonial Development Corporation to take over the management of East Africa Industries Ltd.

The company has agreed to invest 800,000 guilders in the modernisation of machinery and equipment, and will manufacture margarine from raw materials available in Kenya, Uganda, and Tanganyika to be sold within the same area, as far as economically justified.

Can Making in New Zealand

Negotiations have recently been completed whereby The Metal Box Co. Overseas will acquire a substantial interest in a new company to be formed in New Zealand under the name of Harvey Can Company, Limited. The new company, which will be a subsidiary of Alex Harvey and Sons, will have a capital of £300,000 and will operate in the Hawkes Bay district. It will acquire the can making machinery and equipment of J. Wattie Canneries and will supply the latter company with all its requirements of cans.

Danger to Crops from Fission Products

Radioactive strontium, one of the long-lived fission products normally found in atomic detonation residues, is readily taken up by agricultural crops and may be a hazard in this respect, according to research conducted at the University of California's atomic energy project.

Barley, lettuce, carrots, beans, and radishes were planted in various types of soil made radioactive artificially not only with strontium but also with cesium, ruthenium, cerium, and yttrium. It was found that of these elements strontium alone was capable of being taken up in sufficient quantities by plants to be a serious hazard to humans or animals that might eat them.

Radishes and beans took up more of the radioactive material than the other plants. The investigation also indicated that the rate of uptake by plants varied in different types of soil, such uptake being influenced by the amount and type of clay present in the soil.

A new honey jar, designed by Owens-Illinois Glass Company, is equipped with a "drip-cut" dispenser to prevent the honey from running down the sides of the jar. The jar is so designed that it can be used for other products when the honey is finished.

Saltless Bread

For those who must adhere to saltless diets, the announcement made by Mr. E. A. M. van den Zande, a Dutch miller, at a conference of representatives of the baking industry and the Netherlands Government, of the discovery of a saltless bread with good flavour will be of interest.

Laboratory and practical tests were carried out to find a suitable flour which would impart to the saltless bread a taste and texture similar to those of ordinary bread.

In the production of Pasano bread, as it is called, all the constituents added to the flour are organic substances, no chemicals being incorporated. Ordinary bread in Holland contains about 1¼ g. of sodium chloride per 100 g. (3½ oz.), while the new product is expected to contain not more than 5 mg. per 100 g.

The flour is made from specially selected varieties of wheat and laboratory storage tests deliberately made under unfavourable conditions have proved its good keeping qualities, no changes being evident after two months.

Australia and IWA

Australia will now be able to ratify the International Wheat Agreement, according to the Minister of Commerce, Mr. John McEwen, who said all states had agreed to legislate in support of the Federal Government to maintain the Australian Wheat Board as the sole selling authority.

Mr. McEwen said farmers would continue to get a uniform price for all wheat sold overseas from the forthcoming crop " and with the ratification of the IWA the Board will sell the first 48 million bushels of export wheat for 18s. 3½d. a bushel." The Board would sell the remainder of the export surplus at open overseas market prices, now averaging 17s. 6d. a bushel.

West German Meat Production

Current West German meat production covers 97·5 per cent. of domestic consumption, according to a trade association report. Annual *per capita* consumption now amounts to about 40 kilos compared with pre-war consumption of 51 kilos. Pork accounts for 55·9 per cent. of present consumption, beef for 28·5 per cent., and veal for 4·8 per cent.

News from the Ministries

Premier Jus and Oleo Stock

The arrangements for the import of premier jus and oleo stock during the first six months of 1954 will be the same as those for the current period.

Licences will, as in the past, be issued only in response to applications from shredded suet manufacturers (or their nominees), and the amount which may be imported under each licence will be the same as that formerly allocated to the manufacturer by the Ministry of Food from their stocks. Applicants must give an undertaking that any premier jus or oleo stock imported will be used solely in the production of shredded or block suet, and that they will submit a monthly statement showing the quantity imported during that month.

Separate applications on Form ILB/A for each country, together with the undertaking mentioned above, should be sent to the Board of Trade through the Ministry of Food (Oils and Fats Division), London Road, Stanmore, Middlesex.

Licences will be valid until June 30, 1954.

Australian Dried Fruits

Agreement has been reached with the Government of the Commonwealth of Australia on the arrangements for the marketing in this country of Australian dried fruits from the 1954 crop.

A delegation from Australia visited this country in September to discuss the 1954 arrangements and it has now been agreed that the Australian Dried Fruits Board shall be solely responsible for the marketing of the 1954 crop. The Commonwealth Government have relieved the Minister of Food of the obligation under the existing agreement to buy the fruit, but the Minister has undertaken to support the average prices realised by the Board from sales in this country. The agreed support prices are as follows:

£80 per ton for sultanas of all grades from 1 crown and upwards.

£80 per ton for raisins (other than seeded or packeted raisins) of grades 4 and 5 crown.

£75 per ton for currants of grades 3 and 4 crown.

£70 per ton for currants of grades 1 and 2 crown.

If the average realised prices less the cost of ocean freight and landing and selling expenses (*i.e.* the equivalent of f.o.b. Australian port of shipment) fall below these prices the Ministry will pay the difference to the Commonwealth Government.

War-time Regulations Transferred

The use of preservatives in certain foods, until now permitted under Defence (General) Regulations, will in future be controlled under permanent legislation by means of the Public Health (Preservatives, etc., in Food) (Amendment) Regulations, which operated from November 11, 1953, in England, Wales, and Northern Ireland and from November 16, 1953, in Scotland. These regulations will continue to permit the addition of preservatives to certain dehydrated vegetables, jams, and citrus fruits, and will also permit, until the end of rationing only, the continued addition of borax to margarine.

These provisions, except that concerning the addition of borax to margarine, will be examined by the Preservatives Sub-committee of the Food Standards Committee during its general review of the Preservatives Regulations.

The Public Health (Condensed Milk) (Amendment) Regulations, which also came into force on November 11, 1953, in England, Wales, and Northern Ireland and on November 16, 1953, in Scotland, allow the Minister of Food to continue importing, under current contracts which expire in 1954, full cream unsweetened condensed milk which is less concentrated than is required by the United Kingdom standards. The importation and sale of this milk has previously been permitted under the Defence (General) Regulations. When the contracts end, all full cream unsweetened milk imported into the United Kingdom will have to conform to the Public Health (Condensed Milk) Regulations.

Condemned Meat and Offals

New conditions have been announced for the sale by auction of condemned meat and offals from Government slaughterhouses.

Meat and offals bought at auctions must in future be processed, boiled, or sterilised by the buyer before re-sale. If, however, the meat is re-sold to a retailer for animal feeding or to a processor, the liability for processing, boiling, or sterilising must be included in the contract of sale. Condemned meat which has not been treated in this way can be sold to zoos, menageries, and for other specified purposes.

The revised conditions of sale also require sellers of raw condemned meat and offals to inform the Medical Officer of Health in the area where the meat is delivered of the names and addresses of the consignees.

Local authorities are being advised that they will be permitted to remove and dispose of any meat or offals at Government slaughterhouses, found to be unfit for human consumption. Proceeds of such sales will be remitted to the Ministry of Food.

The new conditions began to operate at the series of public auctions beginning at Leeds on December 8 last.

Imports of Sugar Products

Arrangements have been made by the Board of Trade for the import during the period up to June 30, 1954, of certain sugar products, including confectionery, from the sterling area and of other sugar products from both the sterling area and certain foreign countries.

Sale of Dried Fruit Stocks

The Ministry of Food has arranged with the National Association of Dried Fruits Port Services for the marketing of the remainder of the Ministry's stocks.

The Association will be responsible to the Ministry for the sale of the stocks, which will be marketed through the normal trade channels. The arrangements provide for the valuation of the stocks and for a primary offer of parcels and the issue of samples and prices to brokers and accredited agents who will conduct the sales. The list of first-hand dealers to whom sales may be made will be subject to approval by the Ministry. Prices will no longer be controlled but they are expected to range around present levels.

Commonwealth Sugar Discussions

Discussions between the Ministry of Food and representatives of the Commonwealth sugar exporting territories have taken place on the price to be paid for 1954 "negotiated price" sugar bought under the terms of the Commonwealth Sugar Agreement and on other matters arising under it.

Under the agreement the price to be paid for 1954 "negotiated price" sugar will be £41 a ton. This compares with a price of £42 6s. 8d. for 1953.

The calculations under the price formula showed a reduction in the price of sugar owing to a decrease in the index for supplies, particularly of sugar bags and fertilisers. There was no movement in the index of wages and salaries.

The agreement has been extended for a further year and will now run to the end of 1961.

Veterinary Therapeutic Substances

Manufacturers and importers of veterinary therapeutic substances are reminded that the Diseases of Animals (Therapeutic Substances) Order, 1952, which comes into operation on January 1, 1954, prohibits the manufacture for sale or the importation, except under licence, of sera and antitoxins, vaccines, and antigens intended to be used solely for veterinary purposes.

Until the Order comes into operation, the Diseases of Animals (Importation of Therapeutic Substances) Order of 1936 will continue in force. Neither Order affects such import licensing arrangements as may be laid down at the time by the Board of Trade under the Import, Export, and Customs Powers (Defence) Act, 1939.

Application for licences under the 1952 Order to manufacture for sale or to import any therapeutic substance subject to the Order should be made to the Secretary, Ministry of Agriculture and Fisheries, Animal Health Division, Hook Rise, Tolworth, Surbiton, Surrey.

M.o.H. Issues Warning Poster

The fact that in many outbreaks of food poisoning germ-ridden hands are incriminated is portrayed in a new coloured wallsheet produced by the Ministry of Health.

"Every year," states the poster, "thousands of cases of food poisoning are reported and investigated. Some are mild, others more serious—even fatal. Many unreported cases mean still more people ill at home. Most frequent cause is dirty and careless handling of food in food factories, shops, canteens, restaurants and homes."

In pictorial form are shown three ways in which hands can contaminate food; below each the safeguards that should have been taken are illustrated. The advice given includes the covering of cuts, sores, and burns with a waterproof dressing; damaged fingers should have a rubber fingerstall. In handling food, tools should be provided and used: a knife and fork, for example, to place cooked meat in sandwiches; tongs to put food into paper bags.

Food and Drugs Amendment Bill

CONTROL OF HYGIENIC CONDITIONS

The main legislation on food and drugs is contained in the Food and Drugs Act, 1938, which deals with food and drugs generally, and the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, dealing with milk and cream. The Amendment Bill deals very largely with the 1938 Act.

Although the 1938 Act has wide powers and many useful provisions, modern conditions have made it necessary to amend it in certain respects:

1. The control of hygienic conditions under which food is manufactured, prepared, and sold.
2. The introduction of greater flexibility by giving to the Minister regulation-making powers in place of specific powers.
3. The registration of food premises and the licensing of hawkers.
4. The inclusion in permanent legislation of the powers contained in Defence Regulations that have proved their worth, *e.g.* labelling and advertisement of food.
5. The wider control of injurious ingredients.

The greater importance of the food manufacturing industry today and the increase in the number of meals served in canteens and restaurants call for wider and more flexible powers than those of the 1938 Act. To achieve this flexibility section 13, which included specific provisions that are now out of date, has been replaced by general regulation-making powers intended to cover the whole field of hygiene including the construction, equipment and cleanlines of premises, the use of materials, the manufacture of apparatus for the preparation of food, and the inspection of meat. Other powers will enable the disposal of meat unfit for human consumption to be more effectively controlled.

The Ministers are empowered to extend to premises used for other types of food businesses, the existing provisions requiring the registration by local authorities of premises used for the manufacture or sale of sausages, ice cream, and preserved foods. Orders extending registration will require the approval of both Houses. Provision is made for the licensing of hawkers and of people selling food from stalls and vehicles. Registration or licences may be refused or withdrawn, but there is a right of appeal.

Two important provisions which are currently contained in temporary legislation (the Defence (Sale of Food) Regulations, 1943) are made permanent in the Amendment Bill. The first of these provides that the fact that a label or advertisement contains an accurate statement of the composition of the food shall not prevent the Court from finding that the description is misleading. The second is designed to ensure that the public is not misled by claims of nutritional or dietary value.

Many foods are complex manufactured products and chemical substances are used in the course of manufacture to improve the flavour or texture. Some of these substances have not been fully tested and may be harmful in their cumulative if not their immediate effect. Accordingly powers are included to obtain information about such substances, as well as to control their use in food.

Many of the proposed amendments embodied in the Bill are based on the recommendations of the Catering Trade Working Party, the Manufactured Meat Products Working Party, and the Interdepartmental Committee on Meat Inspection.

A Bill for Scotland, similar to the one for England and Wales in the changes it makes in the existing law to meet present-day conditions, has also been published.

Information and Advice

This Service is available to subscribers to FOOD MANUFACTURE. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Screenings

B.6853. *We should be glad if you could inform us of the meaning of the term "screenings" when used in connexion with wheat.* (Wilts.)

The term "screenings" is used for the usable impurities which are removed from wheat during the cleaning processes and hence excludes such contaminants as stones, string, and pieces of metal. The proportion of screenings in wheat varies greatly, but an average figure is 2·84 per cent. made up as follows:

	per cent.
Fine dust	0·32
Light impurities	1·25
Coarse sifted impurities	0·02
Fine sifted impurities	0·07
Barley and oats	0·24
Cockle and seeds	0·84
Effluent recovery	0·10
	2·84

Malt Bread

B.6854. *We wish to manufacture malt bread. Can you supply a formula?* (Herts.)

There are many types of malt bread which range from lightly malted white bread to heavily malted brown bread with a sticky crumb. Many of these breads contain ingredients additional to the malt or malt flour, such as fat, milk powder, and golden syrup.

The following formula for malted brown bread may be used as a basis for trial:

Wheatmeal	28 lb.
Brown malt flour	2 ,,
Salt	8 oz.
Golden syrup	8 oz. to 1 lb.
Fat	8 ,, ,,
Yeast	8 oz.
Water	7 quarts approx.

The dough, which should have a temperature of from 76° to 78°F., is given a bulk fermentation of one and three-quarter hours with a knock-back at the end of one hour. The dough is baked for about 50 minutes in an oven at from 400° to 420°F. Some malt breads may contain fruit.

Rusks

B.6855. *Could you please supply us with a formula for a sweet rusk?* (London)

For a sweet rusk, the dough should be richer than for an ordinary bread dough, and the following formula may be used as a basis for trial:

	lb.		*oz.*
Flour	7	Sugar	6
Fat	1	Malt	2
Water	4	Whole milk powder	8
		Salt	1
		Yeast	3½

The dough should be allowed to ferment for one and one-quarter hours, given a good knock-back, and allowed to lie for a further quarter of an hour. It should be baked in sandwich tins, but less dough should be put in the tins than is used with ordinary bread doughs, and a longer proof should be given. After being baked, the loaves should be kept for two days and then cut into slices of about ¼ in. in thickness which should be baked to a light-brown colour in a cool oven.

Piccalilli

B.6856. *We should be glad if you could give us a formula for piccalilli.* (France)

The following may be used as a basis for trial:

	lb.
Best mustard	36
Turmeric	6
Curry powder	1
Ginger	1
Salt	7
Shallots (finely chopped)	4
Garlic	1½
Sugar	20
Gum tragacanth	5
Vinegar (5 per cent.)	48 galls.

The gum is soaked in 12 gallons of vinegar. The remaining ingredients are put into a pan and simmered for an hour, after which the gum is added, being well stirred in. The sauce is strained, and when cold, is added to the following vegetables:

1 cask cut cauliflower
¼ cask bastards
½ cask beans
1/10 cask gherkins
1 gallon West Indian pickle
1 gallon garlic (finely chopped)
1 gallon mangoes (finely chopped)
1 gallon pickled lemons (finely chopped)
⅛ cask No. 0 silverskin onions.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.6782. *Gelatin capsules.* (Yugoslavia)
B.6783. *Carob bean.* (Mon.)
B.6785. *Polythene containers.* (Lancs.)
B.6786. *Self-sterilising paint.* (India)
B.6787. *Lemon juice.* (Ireland)
B.6788. *Hot plate goods.* (Lancs.)
B.6791. *Centrifuges.* (Durham)
B.6792. *Portable fruit picking tables.* (Ireland)
B.6794. *Tomato juice cocktail.* (London)
B.6795. *Powdered gum tragacanth.* (Lancs.)
B.6796. *Rotary filling of hydrogenated oil.* (India)
B.6798. *Fruit cleaning.* (London)
B.6799. *Sage and onion stuffing.* (Yorks.)
B.6800. *Cocktail cherries.* (London)
B.6801. *Essences for fruit squashes.* (Norfolk)
B.6802. *Composition of American enriched flour.* (Ches.)
B.6803. *Extruding equipment.* (Leics.)
B.6804. *Fruit processing.* (S. Africa)
B.6805. *Composition of guava and beetroot in glass.* (Lincs.)
B.6806. *Grinding mill.* (Southampton)
B.6808. *Dried whole egg.* (Lancs.)
B.6809. *Paper bags.* (British West Indies)

Recent Patents

700,400. INSTITUT DE RECHERCHES POUR LES HUILES DE PALME ET OLEAGINEUX: Method of producing high value carotene containing palm from palm tree waste products.
700,403. LAN-ELEC, LTD., READ, D. M., STAPLES, J., and ANECKI, J. L.: Meat tenderising machines.
700,404. BUHLER, GEB.: Feeder for granular bulk material.
700,420. FORGROVE MACHINERY CO., LTD., and EDIS, J. N.: Wrapping machines.
700,466. LIQUIDOMETER CORPORATION: Apparatus for measuring the amount of liquid in a container.
700,505. HYDE PLASTICS, LTD., and HYDE, J. T.: Sealing discs for the closure members of bottles, jars, and other containers.
700,598. BLENCH, R. O.: Production of caffeine deficient coffee.
700,962. OAKES, E. T.: Method and apparatus for depositing marshmallow, dough, batters, and the like.
700,973. A.P.V. CO., LTD., and UNITED DAIRIES, LTD.: Apparatus for dispensing measured quantities of liquid.
700,974. BAKER PERKINS, LTD.: Swing or like tray bakery units employed in the manufacture of tin bread, and means for loading and unloading such.
700,986. NATIONAL RESEARCH DEVELOPMENT CORPORATION: Treatment or temperature control of milk or other liquid.
701,136. SIMON, LTD., H.: Pneumatic elevators for flour mill stocks.
701,169. COLLINS AND SON (PTY.), LTD., A.: Maize and like shellers.
701,176. GOODALL, C.: Grinding machine.

ABSTRACTS OF BRITISH PATENTS

Stabilised Papain

A stabilised papain composition can be prepared by treating the fresh latex with a minor quantity (by weight-based on the original latex), preferably from 0·1 to 3 per cent. of sodium bisulphite, prior to drying. Moreover, this preservation of proteolytic activity is somewhat further enhanced by incorporating with the fresh latex and the minor quantity of sodium bisulphite, a minor amount of a phenolic compound such as thymol. Papain compositions prepared in this manner still retain all their original proteolytic activity after two to four years of normal storage (room temperature in screw-cap glass containers) as contrasted to a 25 to 50 per cent. loss in activity shown by unstabilised papain preparations similarly stored for only two years.

696,986. *Sterling Drug Inc.*

Aerated Yeast

A method of manufacturing aerated yeast is given which includes the steps of incorporating in one or more phases of the manufacture, in addition to suitable quantities of water and molasses, de-yeasted and/or de-yeasted and de-alcoholised wort from one or more phases of the processes of manufacture of yeast in a preceding operation, and conducting said phase or phases, during which the incorporation of the de-yeasted wort and/or de-yeasted and de-alcoholised wort takes place, in such a way (for example by the addition of alkaline salts) that the *p*H value of the solution remains constantly above the relative isoelectric *p*Hi value of the mixture of molasses and de-yeasted wort and/or de-yeasted and de-alcoholised wort.

This process can be carried out in different ways by removing and reintroducing the de-yeasted wort and/or de-yeasted and de-alcoholised wort in any phase of the process of yeast manufacture by generation in several stages.

The process consists of treating the molasses and the de-yeasted wort distilled or undistilled, either in mixture or separately, by the usual methods of chemical clarification or by any physical method of separating the product of flocculation, for example by decanting, filtering, or centrifugal treatment. The relative isoelectric point of the mixture of molasses and residues, which varies according to the quality of the molasses and of the residues, being determined, the fermentation is conducted in such a way that the *p*H value never falls below the said isoelectric point.

694,786. *Lesaffre et Cie.*

Germ Flour from Cereal Grain

The present invention relates to a process for producing flour from cereals and, more particularly, to a process for making flour containing substantially all the vitamins, oils, and fats present in the cereal, a substantial portion of which is lost under present milling processes. Another object is to provide a process for producing flour that will not become rancid, that will have a superior flavour, and that will contain substantially all the flour contained in the cereal.

Recently attempts have been made to produce a non-rancidifying wheat flour containing substantially all the flour from the endosperm and germ and most of the vitamins, oils, and fats. These attempts have uniformly failed, however, to retain the important vitamins, oils, and fats of the berry, particularly those contained in the germ and aleurone cells.

The failure to preserve the vitamin content of the berry can be attributed to the following reasons: 1. The milling is such as to rupture the individual cells of the germ, endosperm, and aleurone. 2. The aleurone cells, which are between the endosperm and the first coat of bran, are soluble in water, and are dissolved with their vitamin B_1 content in the tempering water.

It is essential not to crush or break the individual cells of the germ and endosperm or the aleurone cells, but to grind the germ, endosperm, and aleurone in such manner that the individual cells are separated from each other rather than crushed. When this is done, little or none of the oil in these cells is freed to be lost or to cause rancidification or to become absorbed by the bran.

651,864. *Dan Hedges Brown.*

Extruding Chocolate

The present invention relates to a method of extruding chocolate, cream, toffee, and similar viscous masses, and in which the mass is dispensed through nozzles into open moulds.

The object is to provide a method for rapidly breaking the sprue when extrusion ceases, thus ensuring that the sprue is not laid over the edge of the mould. This is attained by causing the sprue or thread, formed upon termination of an extrusion period between the nozzle and the mass in the mould, to be engaged by a rotating member for winding the sprue or thread so as to tension it beyond its breaking point.

When engaging the sprue this member will pull it along with it in its direction of rotation so that the sprue is not only broken, but the part thereof above the breaking point is wound on the rotating member thus excluding the risk of dripping.

694,599. *A/S Toms Laboratorium.*

Machines for Bagging Confectionery

Automatic machines of various types for filling bags with measured quantities of a commodity are already known but are in general applicable only to handling bags of paper or having a paper base. In handling bags made of plastic film material a number of problems arise which are not apparent in the handling of paper bags. These problems are due in the main to the extreme lack of rigidity of the plastic film bags compared with the paper and paper-base bags. This necessitates an increase in the mechanical control which is exerted on the bags while they are being opened, filled, closed, and sealed.

It is the main object of the present invention to provide a machine which exercises this increased mechanical control and while it will be understood that the machine according to the invention has been developed particularly for using plastic film bags, it is not limited to the use of such bags but will also operate equally well using paper and paper-base bags.

694,720. *R. W. Barraclough Limited and Ronald William Barraclough.*

ABSTRACTS OF FOREIGN PATENTS

Milk Concentrate

In preparing a completely soluble milk concentrate or milk powder, salts of anhydrous phosphoric acids, such as pyro-, meta-, or poly-phosphoric acids, are added to the thickened or dried milk.

853,250. *Van Hees G.m.b.H.*

Cola Drink

In preparing a cola milk drink, aqueous or alcoholic extracts of the cola nut are condensed after neutralisation by means of disodium phosphate and then milk is added.

853,251. *Wilhelm Muller and anr.*

Coffee Filter

A coffee filter is provided with paper through which the liquid to be filtered runs and gutters lead to the outlet opening. On the base of the filter with inner smooth walls a concentric cylinder is disposed of which the periphery is provided with longitudinal gutters. Each gutter is connected with a hole in the base of the filter casing. A paper sleeve surrounds the discharging filter.

856,693. *Ingrid Oberwinter.*

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Trade Marks

BLUE GOOSE.—687,889. Canned, dried, and preserved fruits and vegetables; and jams, jellies (for food), marmalades and vegetable juices (for food). **American Fruit Growers Incorporated** (a Corporation organised and existing under the laws of the State of Delaware, United States of America), 1116-1117, Oliver Building, Pittsburgh, Pennsylvania, United States of America; Manufacturers.

TOPPAHS.—716,625. Non-medicated confectionery. **South Wales Ice Wafers, Limited,** 62, Pantmawr Road, Whitchurch, Glamorganshire; Manufacturers.

DANIMILK.—717,307. Milk. **Aarhus Oliefabrik A/S** (a Company incorporated under the laws of Denmark), Aarhus, Denmark; Merchants.

NEWTEX.—717,445. Chemical preparations for use in changing the molecular structure of farinaceous substances. **Samuel Neale Dibb** and **Samuel Leslie Neale Dibb,** trading as **Newtex Company,** Thackley Station Buildings, Thackley, Bradford, Yorkshire; Chemical Manufacturers.

MURARRIE.—718,213. Canned meats. **The Queensland Co-op Bacon Association, Limited** (a Joint Stock Company organised under the laws of the State of Queensland, Australia), Murarrie, Brisbane, Queensland, Australia; Manufacturers.

LANKO.—718,502. Chocolate, non-medicated confectionery and biscuits (other than biscuits for animals). **Norman Lang and Sons, Limited,** 87, Bishopsgate, London, E.C.2; Manufacturers and Merchants.

PEESNO.—718,605. Flour made from dried peas. **Joseph Lecher,** 10, Baumleingase, Basle, Switzerland; Manufacturer.

FLAVOUR-KIST.—718,840. Biscuits for human consumption. **Excelsior Biscuit Company, Limited,** 11, Old Jewry, London, E.C.2; Manufacturers and Merchants.

RING-O-ROSES.—718,976. Non-medicated confectionery and biscuits (other than biscuits for animals). **Matlow Brothers, Limited,** Brunswick Works, New Mills, Nr. Stockport, Cheshire; Manufacturers and Merchants.

KARD.—719,325. Edible oils and edible fats. **Kirby's Refineries, Limited,** Albion Works, Clack Street, Rotherhithe, London, S.E.16; Manufacturers and Merchants.

TARNO.—719,406. Wrapping and packaging materials. **National Cellulose of Canada, Limited** (a Joint Stock Company organised under the laws of Canada), Gibson Park, Toronto 9, Ontario, Canada; Manufacturers.

TREBOR FRUBES.—719,833. Non-medicated fruit flavoured boiled sugar confectionery. **Robertson and Woodcock, Limited,** Trebor Works, Katherine Road, London, E.7; Manufacturers.

WHITE CHIEF.—720,034. Bread and flour confectionery. **Tip Top Bakeries (N.I.), Limited,** 43-79, Dunraven Avenue, Belfast; Manufacturers and Merchants.

STARKIST.—720,091. Meat, fish, poultry and game, all being canned or preserved; canned, preserved, dried and cooked fruits and vegetables; and jellies (for food) and jams. **Henry W. Peabody and Company of London, Limited,** 16, Eastcheap, London, E.C.3, Merchants.

CHEEFFLE.—720,355. Cheese and food preparations consisting principally of cheese. **Libby, McNeill and Libby, Limited,** Forum House, 15 and 16, Lime Street, London, E.C.3; Manufacturers and Merchants.

DIAMINTO.—720,606. Boiled sugar confectionery (not medicated), toffee and chocolate, all flavoured with mint. **Diamints, Limited,** 4, Leathermarket Street, London, S.E.1; Manufacturers.

LADYWYTE.—720,655. White bread. **Walklyn, Limited,** 101 to 107, Chatsworth Road, Clapton, London, E.5; Bakers and Confectioners.

PERMARAP.—720,887. Flexible sheets made of plastics for use as wrapping or packaging material. **Imperial Chemical Industries, Limited,** Imperial Chemical House, Millbank, London, S.W.1; Manufacturers and Merchants.

UNIFLAKE.—721,241. Edible oils and edible fats. **The United Yeast Company, Limited,** 80, Miller Street, Manchester; Manufacturers and Merchants.

BAR-NONE.—721,417. Bacon. **Whyte Packing Company, Limited** (a Corporation organised and existing under the laws of Canada), 78, Linton Avenue, Stratford, Ontario, Canada; Merchants.

New Companies

J. S. Baker (Meats), Limited. (524228.) 56, Whitechapel, Liverpool. Nom. cap.: £3,000 in £1 shares. Dirs.: J. S. Baker, 17, Roosevelt Drive, Liverpool, 9, and A. J. Lacey, 110, Eastbourne Road, Liverpool, 9.

Shelpak, Limited. (524420.) 266, Argyll Avenue, Trading Estate, Slough. To carry on business of a packaging service and manufacturers of packaging and packing machines. Nom. cap.: £100 in £1 shares. Dirs.: E. L. Shell and Phyllis N. Shell, 73, Furnival Avenue, Slough, and J. Cunningham, Wexham Place, Stoke Poges.

Ernest Sharp (Millers), Limited. (524507.) To carry on business of corn and grain millers. Nom. cap.: £7,500 in £1 shares. Dirs.: to be appointed by subs. Subs.: Dorothy M. Vollans, 32, Greenwood Street, Savile Town, Dewsbury (clk.), and Mary Collett, Manse House, Springfield Terrace, Dewsbury (clk.)

Bournemouth Kosher Food and Meat Provisions, Limited. (524613.) 56, Holdenhurst Road, Bournemouth. Nom. cap.: £1,000 in £1 shares. Dirs.: S. Dell, 21, Church Mount, London, N.2, and M. Lamport, 53a, Brim Hill, London, N.2.

John Morgan Sausages, Limited. (524630.) 110-112, Digbeth, Birmingham, 5. To take over business of a ham and bacon curer and sausage manufacturer carried on at Birmingham by John Morgan. Nom. cap.: £25,000 in £1 shares. Dirs.: J. Morgan, P. Morgan, and Violet L. Morgan, all of 70, Salisbury Road, Moseley, Birmingham, 13.

Pizza Foods, Limited. (524641.) 36, Broadmead, Bristol, 1. To carry on business of manufacturers of and dealers in an Italian type of pasty known as "Pizza." Nom. cap.: £100 in £1 shares. Dirs.: G. K. McCall, 3, Lansdowne Place, Clifton, Bristol, 8; D. T. P. King, 54, Charlton Road, Keynsham, Somerset; J. Atkinson and E. Atkinson.

Tonkins Poultry Products, Limited. (524739.) 56, St. Mary Street, Weymouth. Nom. cap.: £500 in £1 shares. Dirs.: M. G. Sapsworth, 98, Wyke Road, Weymouth (mang. dir.), and C. E. Tonkin, Pinecones, Blakehill Crescent, Parkstone, Dorset.

H. and J. M. Bennett (Produce), Limited. (524881.) To carry on business of commission buying agents and merchants; nut roasters, canners and processors, and quick freezers. Nom. cap.: £5,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: Jean Herbert (co. dir.), and Claire Moore (secy.), 128, Albany Street, London, N.W.1.

L. Karlin and Company, Limited. (524889.) To carry on business of manufacturers of and dealers in cocoa and coffee beans, oils, oil cakes and seeds, fats, and grain. Nom. cap.: £10,000 in £1 shares. Dirs.: not named. Subs.: L. Karlin (co. secy.), 11, Tudor Court, Gunnersbury Avenue, London, W.5, and Betty Taylor (secy.), 11, Colombo Road Ilford.

Middleton Confections Company, Limited. (524894.) 74, Mansfield Road, Nottingham. To take over business of sweet manufacturers carried on as "Meadow Confections Company" at 62a, Edwin Street, Nottingham, by Edward W. Woolhouse and Ernest Williamson. Nom. cap.: £2,000 in £1 shares (100 pref.). Permt. dirs.: E. Williamson, 1, Lynmouth Crescent, Nottingham, and E. W. Woolhouse, 53, Pierrepoint Road, West Bridgford.

Falcon Casing Company, Limited. (524968.) To carry on business of sausage casing manufacturers. Nom. cap.: £650 in £1 shares. Dirs.: S. G. C. Jerman, 13, Goreshook Road, Dagenham; S. J. Curham, 61, Molesey Close, Walton-on-Thames, and J. L. Keeys, 4, Falcon Road, Battersea, London, S.W.11.

Averill (Cooked Meats), Limited. (525107.) 165, High Street, Aston, Birmingham, 6. To take over business of manufacturing and vending cooked and fresh meats carried on by Bernard C. Averill. Nom. cap.: £6,000 in £1 shares. Dirs.: B. C. Averill and Gertrude E. Averill, 20, Wye Cliff Road, Handsworth, Birmingham.

C. and A. Gould, Limited. (525151.) Bansons, High Street, Ongar, Essex. To carry on business of millers, manufacturers of and dealers in corn, grain, and seeds. Nom. cap.: £60,000 in £1 shares. (10,000 cum. pref.) Dirs.: A. G. Gould, Little Roothing, Moreton, Nr. Ongar; P. R. N. Gould, Mead Cottage, Hibbs Cross, Harlow, Essex; C. Place; H. T. Richardson, and B. C. W. Williams.

Deepfreeze (Blackpool), Limited. (525205.) 26, Cookson Street, Blackpool. To carry on business of manufacturers of and dealers in refrigerators and cold storage plant. Nom. cap.: £1,000 in £1 shares. Permt. dirs.: K. W. Bridge, 26, Cookson Street, Blackpool, and P. A. Taylor, 128, Ansdell Road, Blackpool.

Dominic (Brands), Limited. (525338.) 31, Kings Road, Sloane Square, London, S.W. To carry on business of dealers in tinned, canned, preserve and process fruit, and fruit juices. Nom. cap.: £100 in £1 shares. Dirs.: A. A. Zatouroff and Lucienne M. M. Zatouroff, 15, Basil Mansions, Basil Street, London, S.W.3.

Deep Freeze and Cold Storage (Northants), Limited. (525376.) 56, Guildhall Road, Northenden. Nom. cap.: £14,000 in £1 shares. Permt. gov. dir.: T. R. Mayes, Lodge Farm, Castlethorpe, Wolverton, Bucks.

Candymaster, Limited. (525436.) Fresh Wharf, Highbridge Road, Barking. To carry on business of manufacturers of and dealers in chocolate, boiled and other sweets; and tobacconists, aerated and mineral water manufacturers and dealers. Nom. cap.: £100 in £1 shares. Dirs.: C. T. Williams and Gladys C. Williams, 18, Catherine Court, Chase Road, London, N.14.

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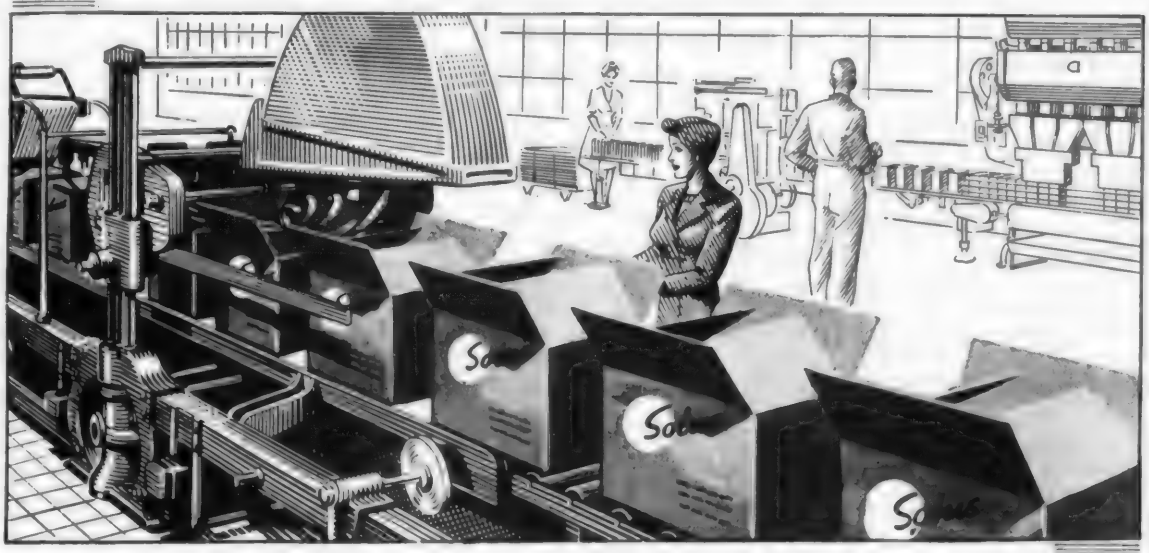

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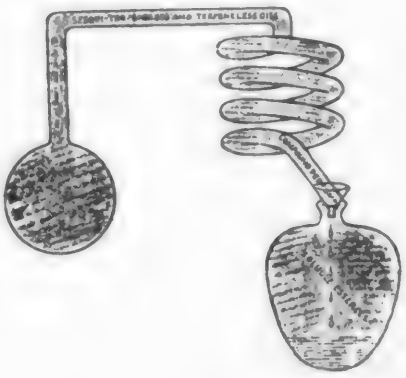

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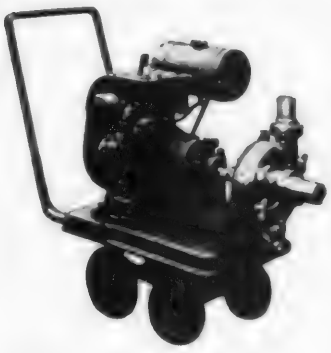

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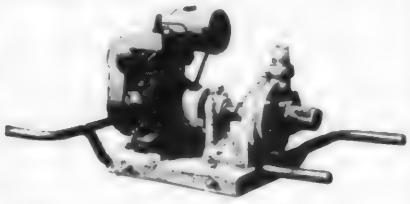

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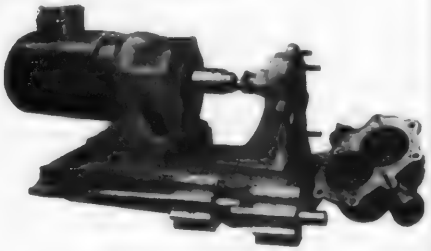

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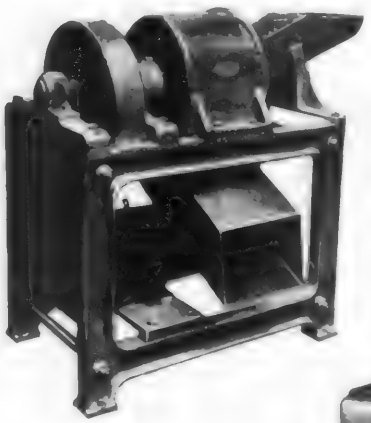

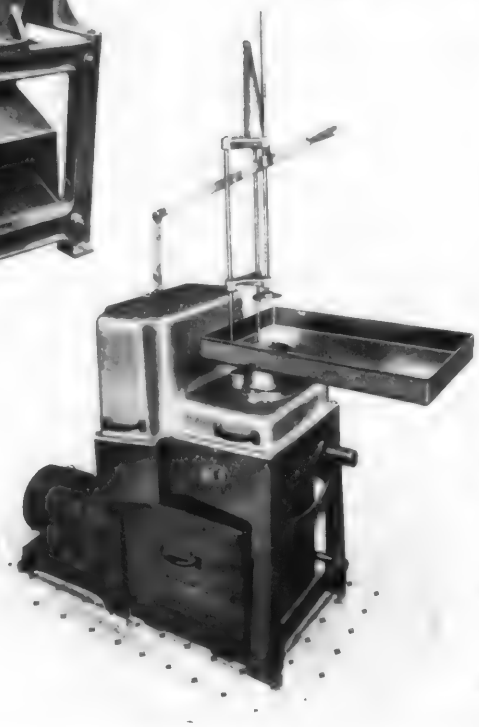

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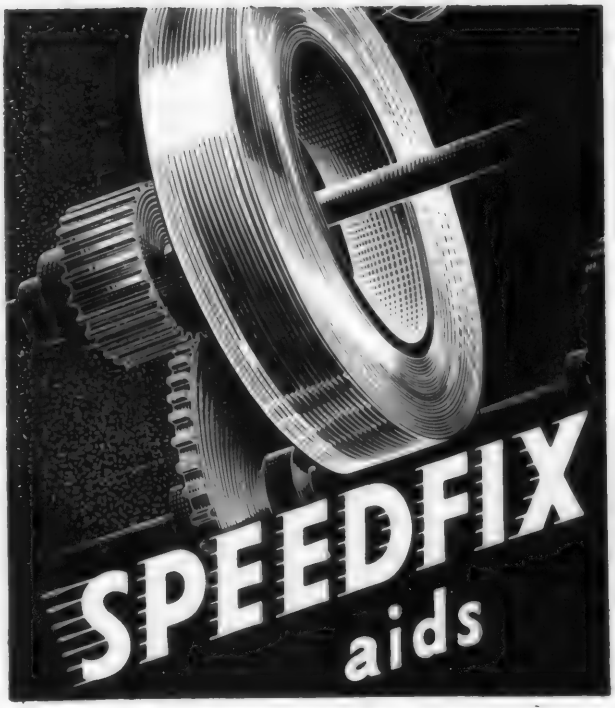

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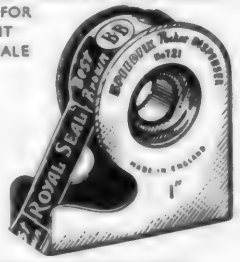

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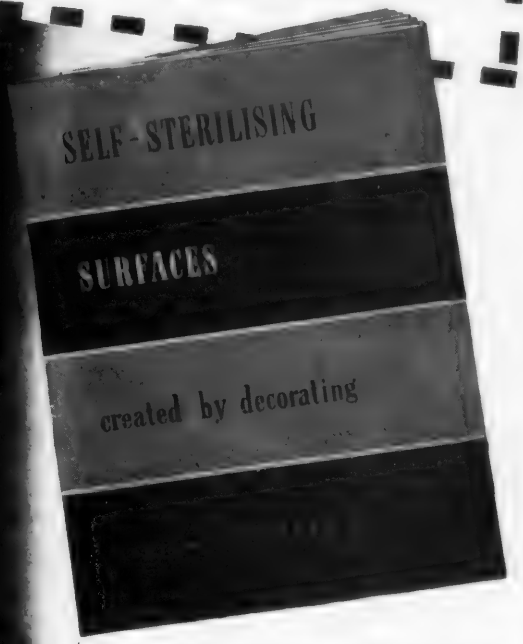

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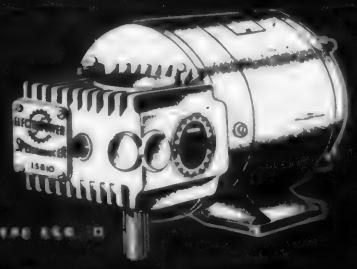

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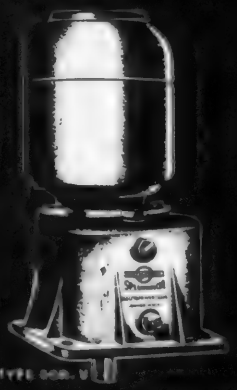

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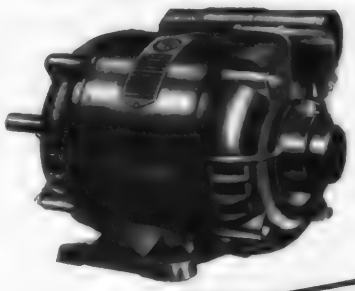

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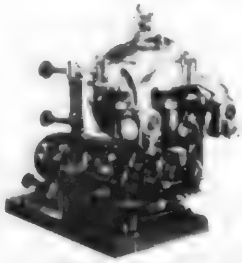

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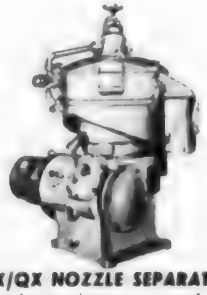

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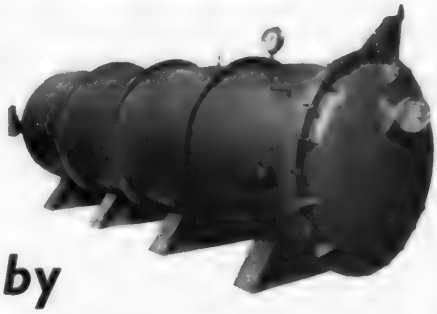

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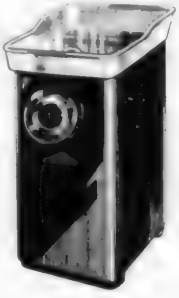

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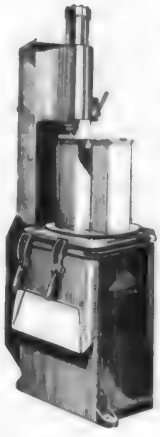

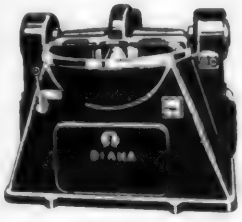

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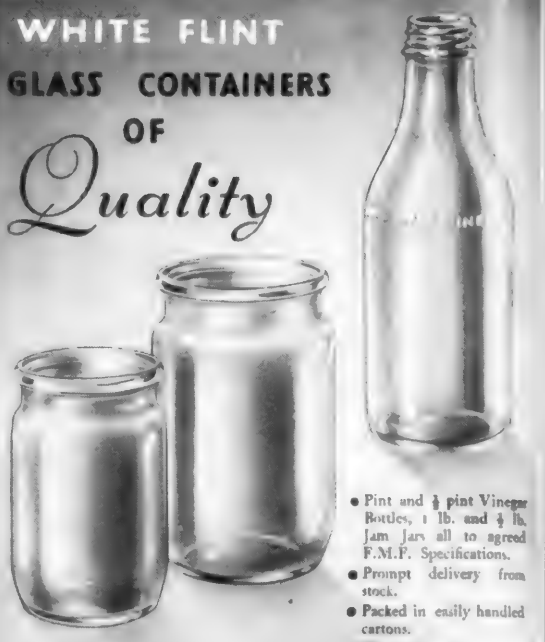

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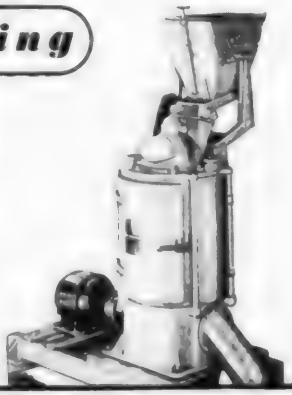

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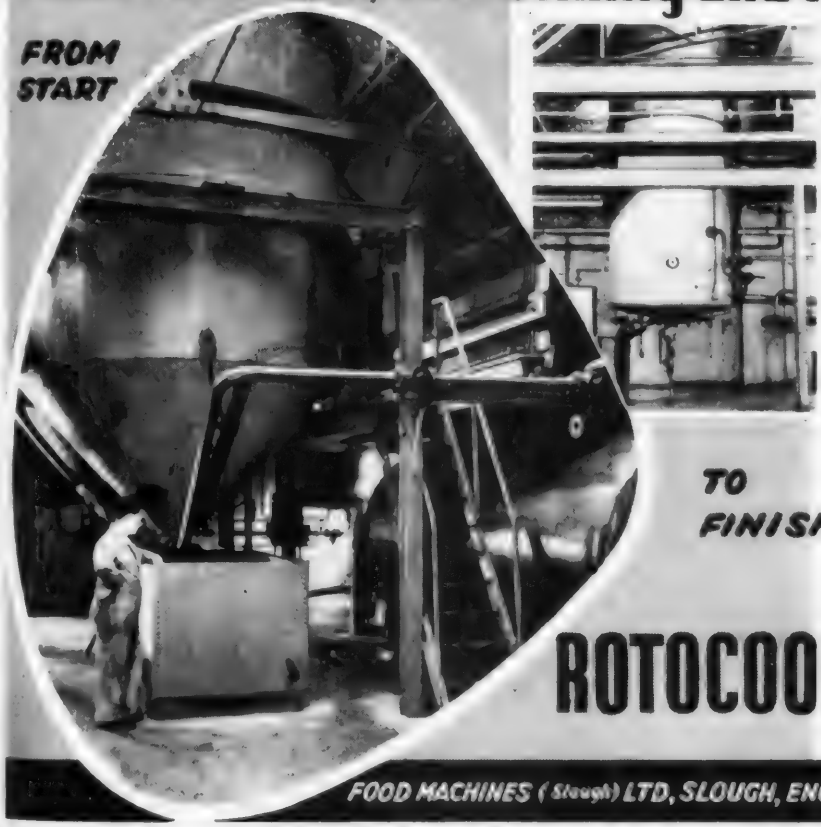

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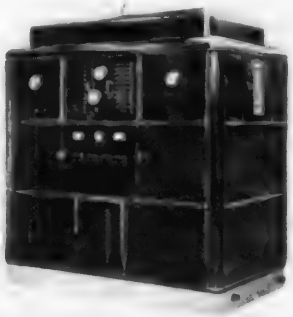

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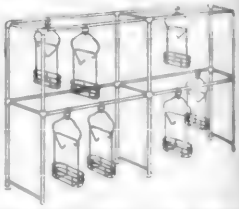

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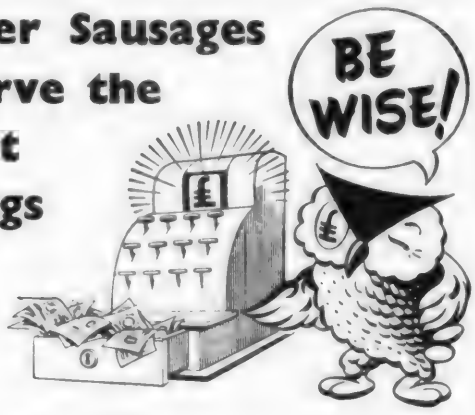

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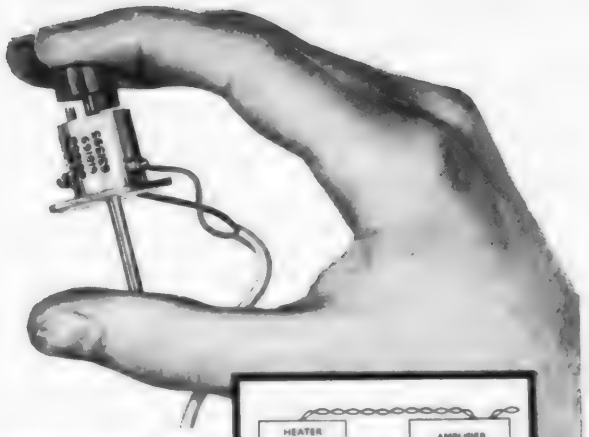

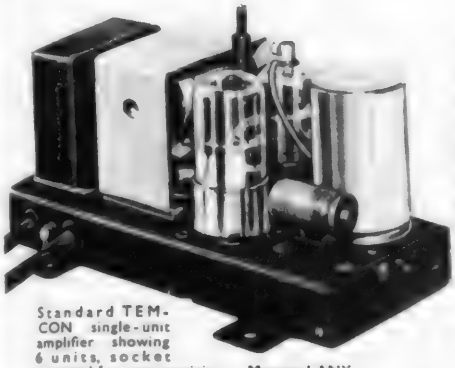

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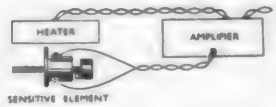

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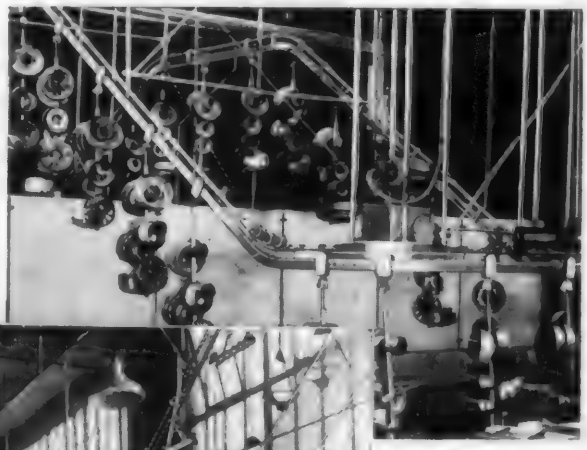

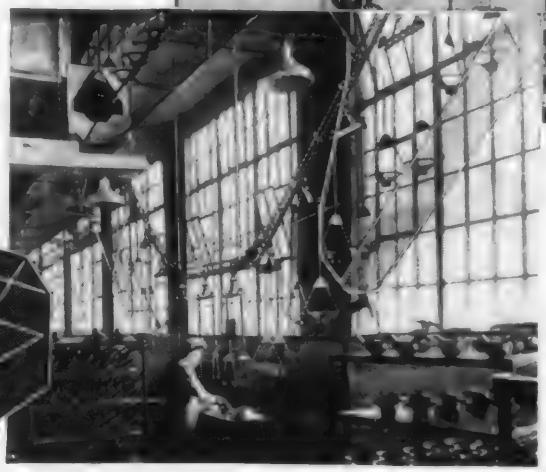

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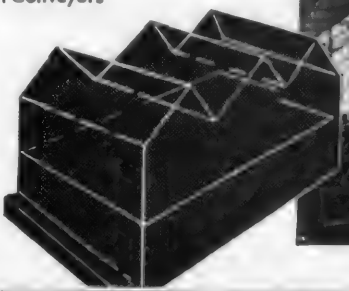

Illustrated is an example of a Teleflex Conveyor which travels all round a particular factory.

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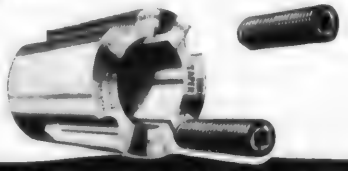

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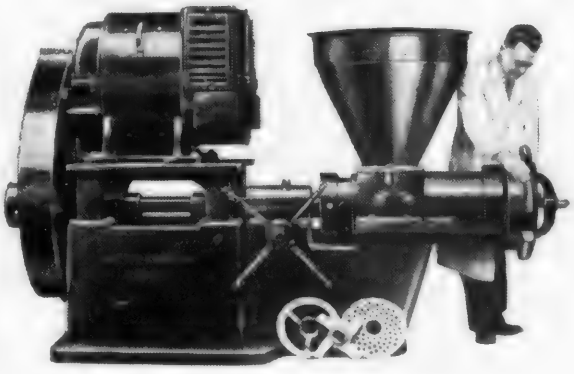

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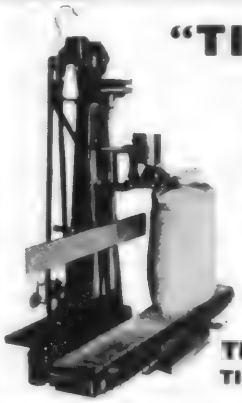

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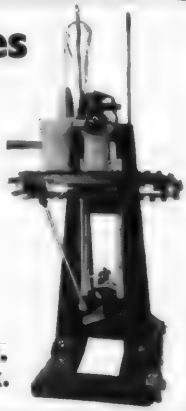

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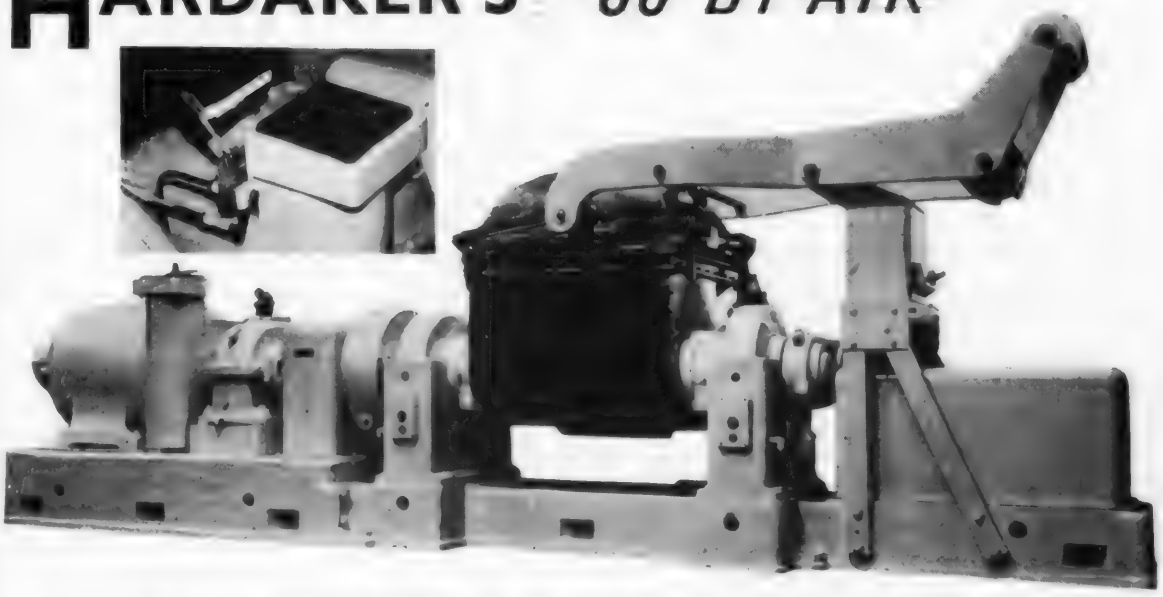

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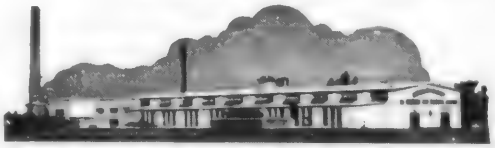

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PRODUCTION Manager required with sound experience in general works engineering, packaging and bottling. Knowledge of oils, fats and waxes desirable. Progressive post. New town of Stevenage, Hertfordshire.—Write with full particulars to **Box B4520.**

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FOR Sale: Vacuum Stirring Pan "A." Body in tinned copper. Driven by 10 h.p. motor through reduction gear. Mounted on R.S.J. staging; Vacuum Drying Oven "B" with steam heated shelves capable of holding 32 tinned copper trays. A further set of 32 copper trays, spare, for re-charging. Hicks Hargreaves Vacuum Booster for 100-lb. steam pressure for above; Purdy "New-Way" Label Machine. Overhauled 1951.—Box B4532.

WALMAR Mark V Chocolate Enrober, with cooling section approx. 56 in. long, mounted over 6 ft. centres, 6 in. wide flat belt Conveyor. Air operated rippler with cooling by York Shipley Refrigerating Unit.—Box B4538.

FILTER Press by Johnson, with 30 chambers, plates and frames aluminium alloy 22 in. sq. by 1½ in. thick. Individual chamber discharge with troughs.—Box B4539.

TOTALLY Enclosed Copper Vacuum Evaporating Pan by Kellie, of Dundee, 4 ft. diam. by 2 ft. deep on straight, flanged to 26 in. deep hemispherical bottom, bolted on cover with vert. motorized anchor type agitator. Jacket suitable for 50 lb. sq. in.—Box B4540.

SECOND-HAND PLANT WANTED

PEA Viner required, age not important but must be in reasonable order.—Full details and price to Box B4509.

WANTED: Gardner Mixer, approx. 20 cu. ft. per mixing, must be in good condition.—Box B4512.

WANTED: Rose or Forgrove Wax Wrapping Machine for Cartons size 5¾ in. by 2⅛ in. by 1 7/16 in. and 6⅛ in. by 3¼ in. by 1¼. State make, condition and price.—Box B4517.

WANTED: Automatic Pea and Bean Filler also M. and P. Dicer.—Manucraft Engineering Co. Ltd., Pryme Street Mills, Pryme Street Manchester 15.

WANTED: Electric Elevating Truck to lift stillage 3 ft. by 2 ft. with 6 in. ground clearance. State price and condition, etc.—Box B4524.

LAABS Dryer, steam jacketed or other type, required, up to 2-ton size, with Agitating Gear.—Full details Box B4529.

TWO Steam Ovens urgently required. Approximate inside dimensions 65 in. high by 34 in. wide by 42 in. deep. Front opening door in good condition tested to 50 lb. per square inch.—Details to Box B4472.

LIGHT Conveyor wanted, flat belt type; state size, price, etc. Fruit Can Filler also wanted.—Box B4487.

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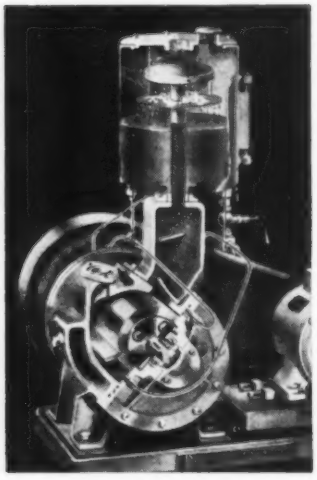

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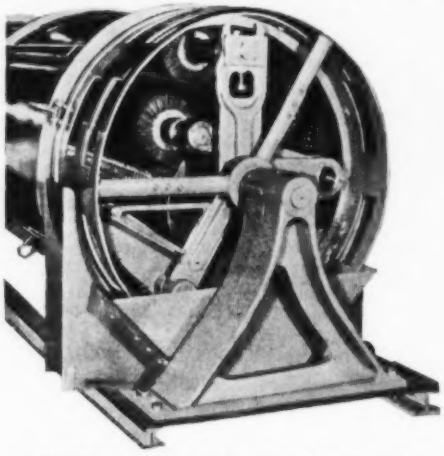

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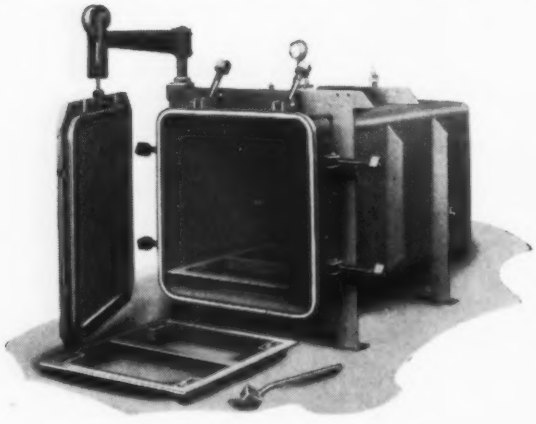

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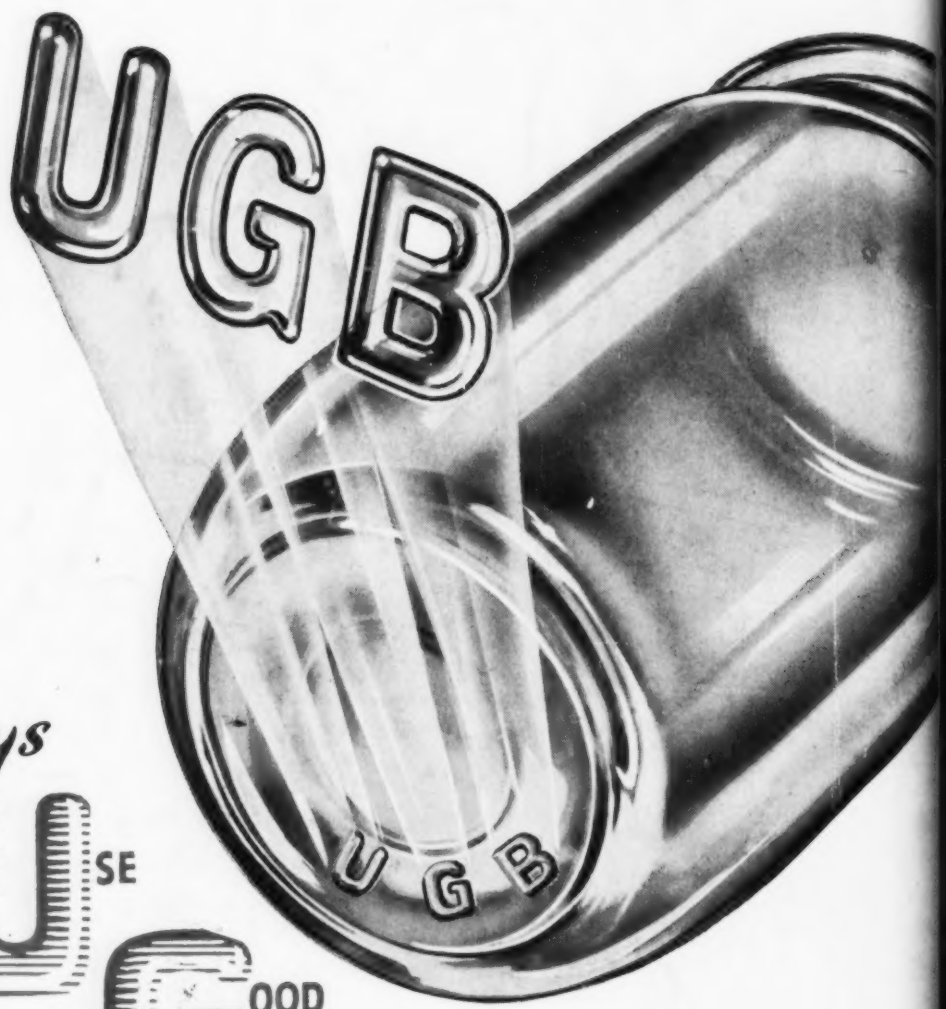

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Registered for Transmission to Canada including Newfoundland